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ABSTRACT

The Michigan Mathematics Early Placement Test (MMEPT) is an assessment instrument that gives 11th-grade students an appraisal of their mathematical skills in relation to college expectations. Students who take the test receive a report letter that tells them, based upon their test results, approximately where they would be placed in mathematics if they were entering college at the time of the test. The letter also describes the mathematics needs for two career fields of interest to them. Patterned after the Ohio Early Mathematics Placement Test, the MMEPT is sponsored by Michigan's Presidents Council of State Colleges and Universities and administered by the Glenn T. Seaborg Center for Teaching and Learning Science and Mathematics at Northern Michigan University. With state funding included in the Higher Education Appropriations Bill, the MMEPT was offered to all high schools in Michigan for the first time in 1986-87. Over 28,000 students from 345 of the 900 high schools took the test. This report discusses in detail the results of the MMEPT's first year. It includes 26 charts and tables, sample student letters, and sample school summary reports. (Author/TJH)

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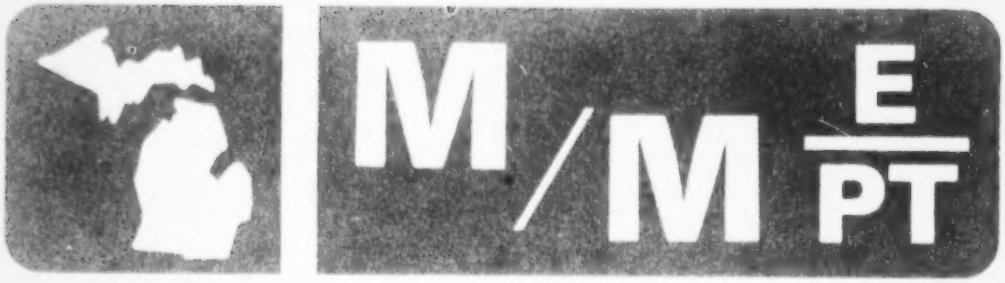
The Michigan Mathematics Early Placement Test 1986-87

Final Report
September 2, 1987



A Program of
The Presidents Council of
State Colleges and Universities

Administered by
The Glenn T. Seaborg Center
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The Michigan Mathematics Early Placement Test is an assessment instrument which gives 11th grade students an appraisal of their mathematical skills in relation to college expectations. Students who take the test each receive a report letter which tells them, based upon their test results, approximately where they would be placed in mathematics if they were entering college at the time of the test. The letter also describes the mathematics needed for two career fields of interest to them. Patterned after the Ohio Early Mathematics Placement Test, the MMEPT is sponsored by Michigan's Presidents Council of State Colleges and Universities and administered by the Glenn T. Seaborg Center for Teaching and Learning Science and Mathematics at Northern Michigan University. With state funding included in the Higher Education Appropriations Bill, it was offered to all high schools in Michigan for the first time in 1986-87. Over 28,000 students from 345 of the 900 high schools took the test. This report discusses in detail the results of the MMEPT's first year. It includes 26 charts and tables, sample student letters and sample school summary reports.

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Final Report
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Administered by
The Glenn T. Seaborg Center
Northern Michigan University
Marquette, Michigan

Prepared by: John O. Kiltinen, MMEPT Program Director, Stephen M. Hirst, Administrative Assistant and Mary Ann Joyal, Data Manager and Programmer

Acknowledgments

Many people have contributed to the MMEPT program's success in its first year of general offering. The taxpayers of Michigan, the Legislature and the Governor have generously provided financial support through the Higher Education Appropriations Bill. The presidents and chancellors of Michigan's fifteen state-supported colleges and universities through their sponsorship of the MMEPT in the Presidents Council have demonstrated an important institutional commitment to the program. Dr. Glenn R. Stevens, Executive Director of the Presidents Council, has provided invaluable liaison with the Legislature and with interested educational constituencies.

The MMEPT Committee, including representatives from the mathematics departments of the state colleges and universities and others, has provided continuous advice and guidance to the program. Dr. Bert Waits of the Ohio Early Mathematics Placement Test program has been very generous with his help and advice. The MMEPT could never have progressed as rapidly as it has without the benefit of the Ohio experience.

Many people at Northern Michigan University and its Seaborg Center have contributed significantly to the MMEPT's efforts to deliver services in a timely and efficient manner. MMEPT secretary Debra Laliberte deserves special mention for establishing the office procedures to get the job done. Others include staff members of the Computer Center, the University Editor's office, Printing Services, the mail room, and our student employees.

Finally, we thank the high school mathematics teachers and department heads, counselors and principals who took the initiative to make the MMEPT available to students in their schools. We add special thanks to those who took the extra time to return their encouraging comments about the program.

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THE MICHIGAN MATHEMATICS EARLY PLACEMENT TEST
1987 FINAL REPORT

INTRODUCTION

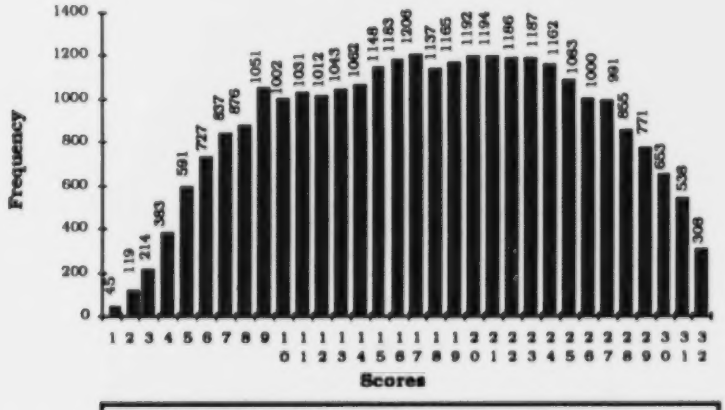
During its first year of full-scale statewide use, 28,094 high school juniors from schools across the state of Michigan took the Michigan Mathematics Early Placement Test. The 345 schools who used this voluntary testing program included 55 private schools and comprised overall more than a third of the state's 900 schools. They tested groups from as small as 1 to as large as 547 students. Schools from nearly every county took part in the program (See map A), which one teacher characterized as the "best testing program I have been part of in twenty years of teaching."

Overall, just over half of those taking the MMEPT scored at or above the minimal level for beginning college mathematics. At this minimal level the student would be ready to enter college algebra--the equivalent of the high school second-year algebra course college-preparatory juniors usually take. The rest of the students taking the test, however, scored at potentially remedial levels; 25 percent scored low enough to indicate a need for more arithmetic and introductory algebra. The mean score for the entire group stood at 17.7, with 18 representing the cut-off for non-remedial placement. (See chart B)

The mean scores of those students enrolled in second-year algebra at the junior year stood a full 8 to 9 points above those enrolled in courses of lesser content, indicating the importance of taking the proper high school mathematics courses. At the typical school, nearly 7 percent of those taking the MMEPT were not taking any math course at the time of the test.

The 32-question test focused on arithmetic and early algebra skills to give an idea of the placement a high-school junior might expect if he or she were to enter college at the time of testing. The purpose of testing at the junior year is to provide the student early enough advice on math skills that he or she can use the senior year to prepare for successful college entry.

Chart B: **Score Frequencies: All Students**

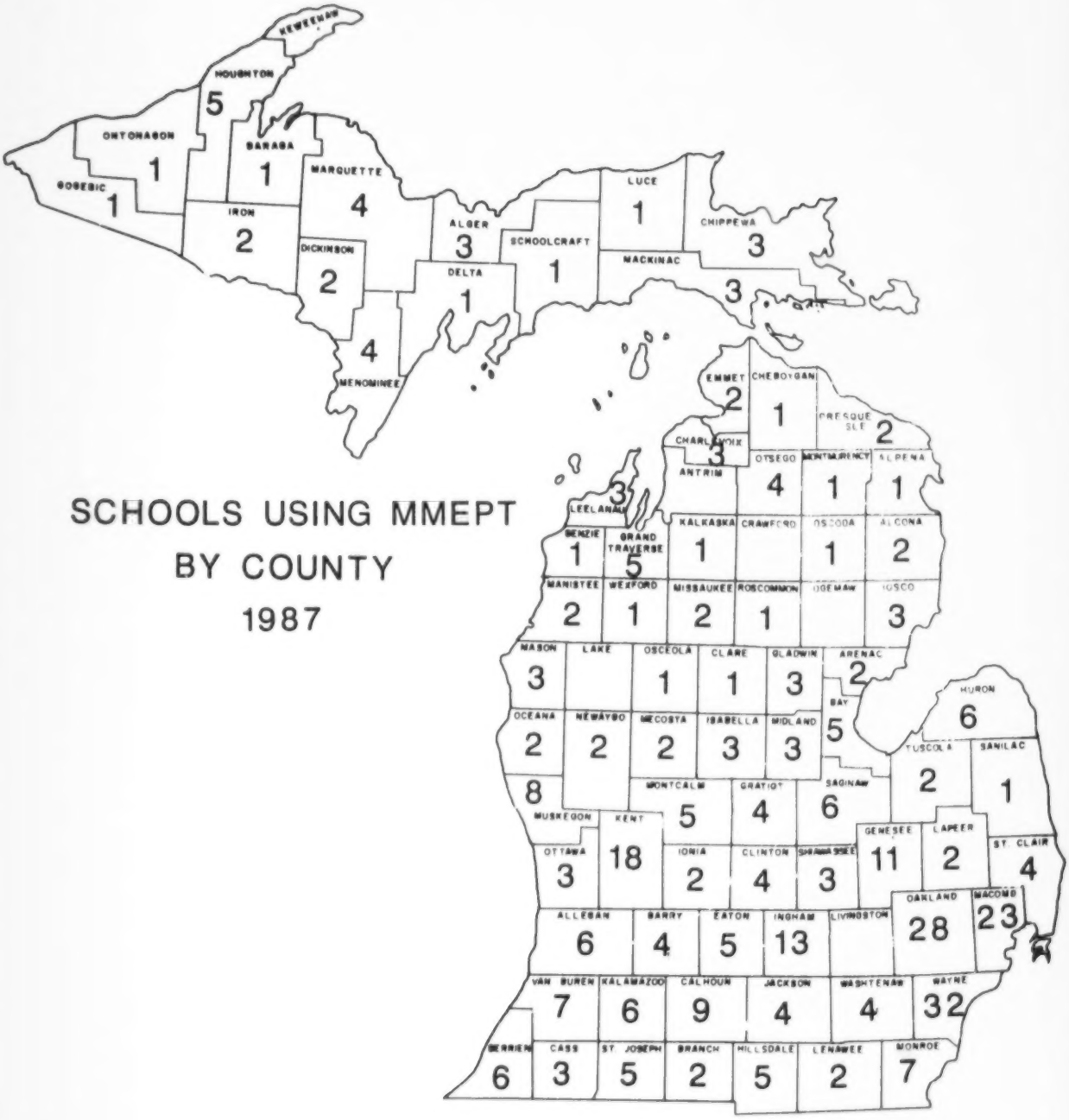


Statistics: Mean: 17.7 Median: 17.4 Mode: 17
Standard Deviation: 7.5

As another teacher reported, "Our students definitely gained an insight into the necessity for more math prior to going to college."

Scores from 0 to 11 placed a student at Level 5, needing further work in arithmetic skills and early algebra; from 12 to 17 at Level 4, needing work in intermediate algebra; from 18 to 25 at Level 3, ready for college algebra; from 26 to 32 at Level 2, ready for pre-calculus.

MAP A



SCHOOLS USING MMEPT
BY COUNTY
1987

The MMEPT does not test for calculus readiness, Level 1, as its designers assumed few high school juniors would have enough mathematics training to test at this level yet.

The MMEPT also included a series of personal background questions to supply information on what students are studying as well as on their plans. From the responses one gains a perspective not only on Michigan's population of college-bound students but also on some of the factors affecting their math readiness for college study.

MMEPT Director Dr. John Kiltinen says, "Our analysis of results for our first year of full-scale implementation leads us to the following conclusions:

- "The level of participation (345 schools) indicates that the MMEPT has been well received and that high school mathematics teachers and counselors share our perception of the need for such a program. Their strongly favorable comments after using the program shows that they feel it is meeting its objective.

- "Test results indicate a strong correlation between student course-taking patterns and MMEPT scores. In short, results show that the more mathematics students take, the better they do.

- "There is considerable room for improvement in overall student performance. It should not be regarded as acceptable that, while 91 percent of those tested plan to go to college, nearly half of them score in the remedial range.

- "Performance of students taking second-year algebra (Algebra II) should receive particular scrutiny. The 54 percent of the students who were taking this course spread very broadly across the range of scores. School averages for Algebra II were also broadly distributed. These results indicate a need for those at the lower end of the scale to review the level of expectations they are setting in their curriculum and perhaps the quality of instruction."

THE RESULTS

While nearly one-fifth of the students scored at the test's highest level (Level 2), the results still begged improvement in several areas. For one, nearly half of the students' scores stood at a level that would place them into remedial classes if they were entering college.

Also, while the test did rate half the students ready for college mathematics, one must remember the boundary between "college mathematics" and "remedial" levels only marks the lowest acceptable level for college work. Students entering college at Level 3 might fare well in non-technical fields, but those planning to study technical subjects would need to enter at Level 1 (ready for calculus) or better.

The results indicated such a correlation between intended college majors and levels of mathematics preparation; students aiming toward mathematics or physical science careers or medicine showed significantly better preparation than those choosing less math-intensive fields. However, nearly 40 percent of the students

who expressed an interest in engineering scored at remedial levels 4 and 5. Ideally, they would enter college at Level 1, but their remaining year in high school will not allow them enough time to advance that far. The 3,207 students at levels 4 and 5 who expressed an interest in business as a college major need to advance to Level 3 or higher before entering college, depending on their college choice and specific major.

Certainly these results corroborate the teacher who commented, "My students were surprised at the amount of math needed in their major areas of interest."

Over half of those considering teaching (other than secondary mathematics or physical science) placed at remedial levels. Considering that many of these students will have to teach mathematics themselves as prospective elementary teachers, this result causes some alarm. (See chart C)

Chart C: Placement Levels by Planned College Majors

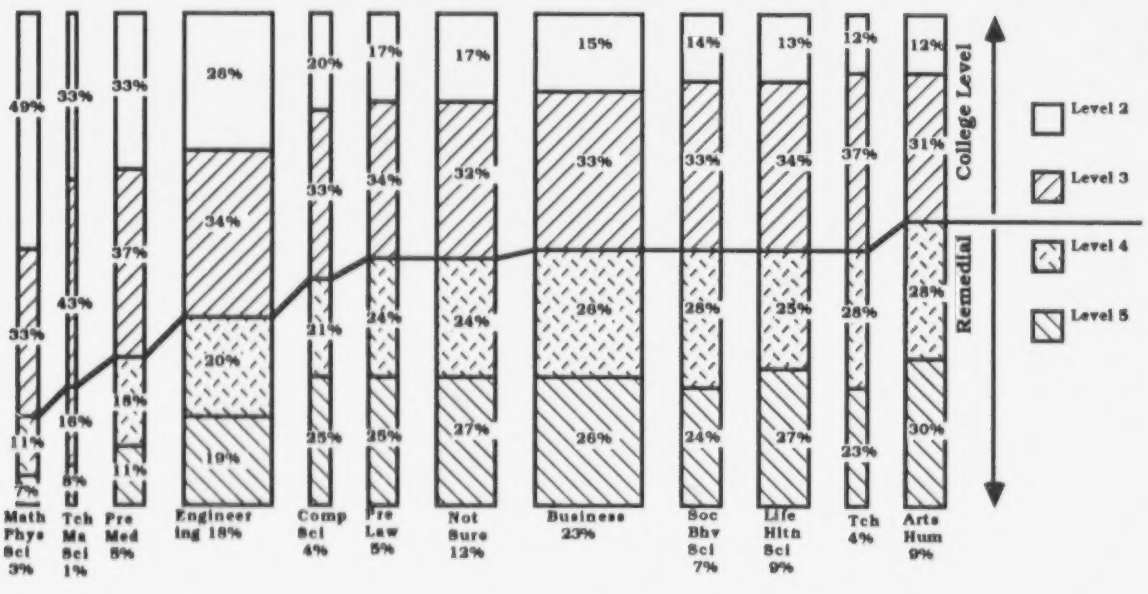
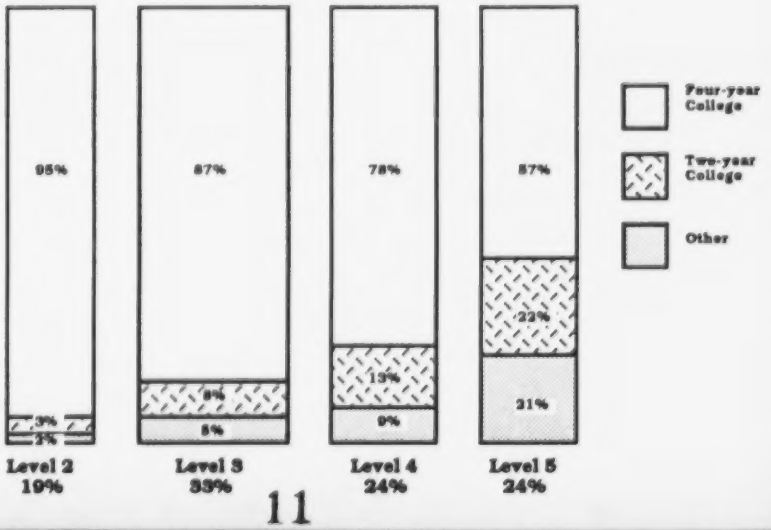


Chart D: Post High School Plans by Placement Level



In short, 8,784 students (31 percent of the total) planned to attend a four-year college yet placed at a remedial level. An additional 2,319 (8 percent) received remedial ratings and planned to attend a two-year college. These 11,000+ students will face difficulties and delays as they enter college with weak mathematical backgrounds. Some will find interesting fields of study beyond their reach. (See chart D)

How high school math studies affected test performance

Chart E shows, to no one's surprise, that taking high-school mathematics makes a dramatic contribution toward one's mathematical preparation for college. Those taking advanced courses beyond second-year algebra scored predominantly at the high end of the scale, while students not taking mathematics or taking lower level courses than Algebra II clustered at the low end of the scale. The mean score for students not enrolled in any math course stood at 10; for those enrolled in math courses at a lower level than Algebra II it stood at 11; for those enrolled in Algebra II it stood at 19; those taking more advanced courses averaged a score of 24.

No doubt students' differing mathematical capabilities correlated with the courses they selected and explained a part of the striking differences in the test profiles. At the same time, it does seem certain that further mathematics study should improve any student's placement results.

Chart E: Score Frequencies in Percent By Level of Current Math Class

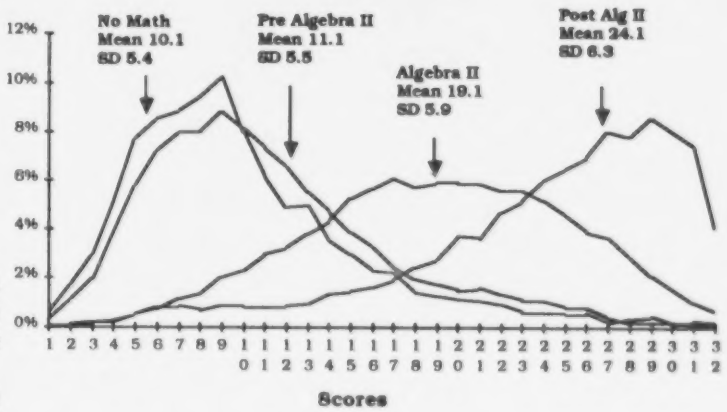
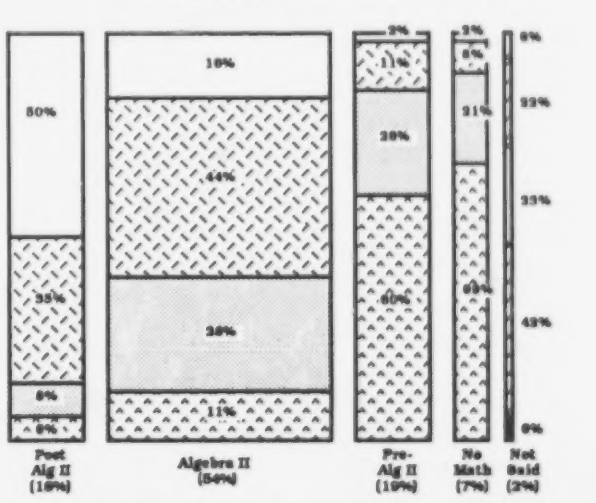


Chart E also shows the very broad distribution curve for those students specifically taking Algebra II. Since this very large group (54 percent of the total) was taking the standard college-preparatory course for juniors, their performance holds particular interest. This chart, as well as charts F and G, show more spread in the results than one would like to see, particularly toward the low end of the scale. High school Algebra II compares closely in content and level of difficulty with contemporary college algebra courses. To place into college algebra (Level 3) one should score 18 or better on the MMEPT. Yet 39 percent of the Algebra II students scored at levels 4 or 5, indicating background too weak for the course they are currently taking.

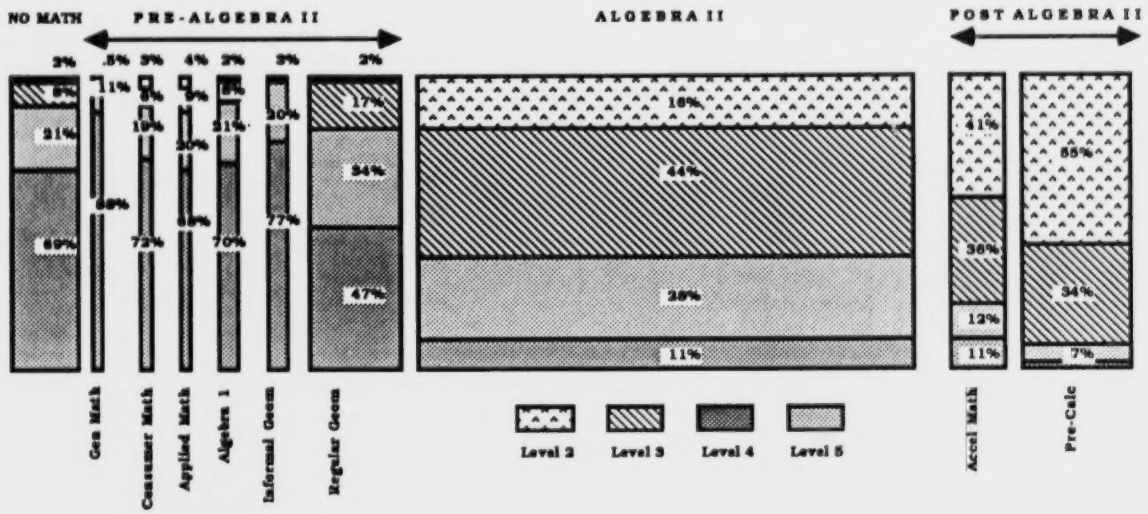
Traditionally, an Algebra II (or college algebra) course should prepare students for pre-calculus, although not all students will follow this course with calculus. A student who meets the objectives for completing Algebra II should therefore expect to place at Level 2 with a score of 26 or higher. With these students already two-thirds of the way through the course at the time of testing, one might expect many of them to place at Level 2. Only 16 percent did.

Chart F: Placement Levels By Current Math Class Group



On the whole, an upward shift in the Algebra II group's results would make educators and college admissions officers more comfortable.

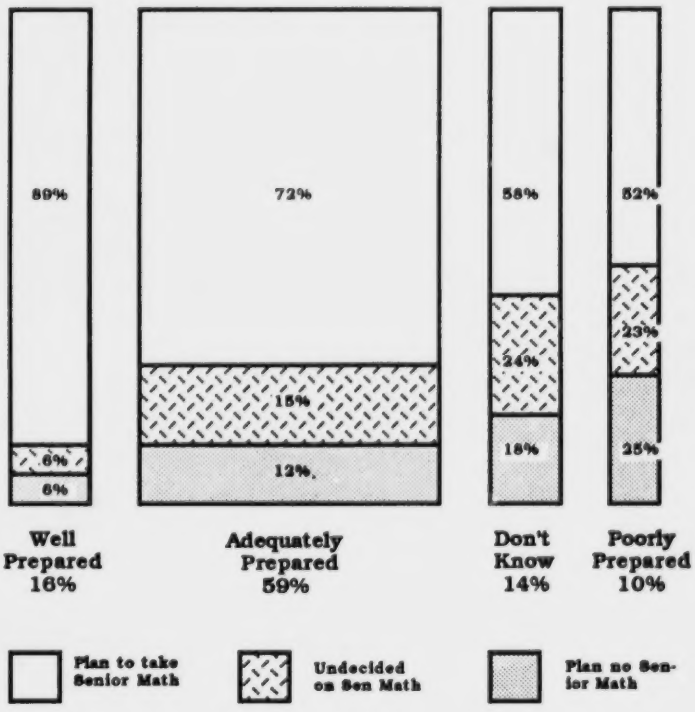
Chart G: **PLACEMENT LEVELS BY CLASS ENROLLMENT**



How well do the results bear out students' self-perceptions?

Those who felt least well prepared in mathematics were also least likely to do anything about it by taking a senior-year mathematics course (See chart H). To make matters worse, those whose plans did not include taking senior year math also scored lowest on the MMEPT. While 61 percent of those planning to take senior year math scored at Level 2 or 3, 71 percent of those planning no senior year math scored at Levels 4 or 5 (See chart I). Overall, 70 percent of the responding students said they would take senior year math. However, more than 60 percent of those who had not decided on senior math or already decided against it still indicated their intent to attend a four-year college or university.

Chart H: **Senior Math Plans vs. Confidence**



Comparing placement results with students' own perceptions of their mathematics readiness yields a close match. Eighty-six percent of those feeling well-prepared scored at Levels 2 or 3, as did 54 percent of those characterizing their preparation as adequate. Sixty-nine percent ot those who didn't know how to characterize their preparation scored at the remedial levels 4 and 5, and 87 percent of those who called their preparation poor scored at the remedial levels. (See chart J)

One teacher commented that because of the test, "The students were reminded that math during their senior year is very important."

Chart I: **Placement Levels by Senior Math Plans**

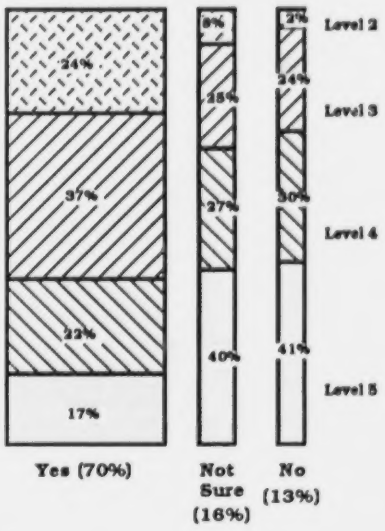
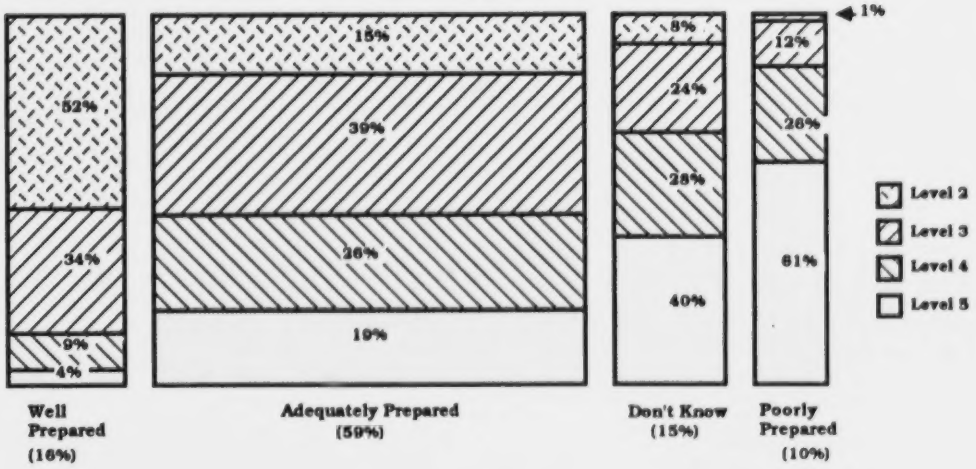


Chart J: **Levels vs. Confidence in Preparation (In Percent)**

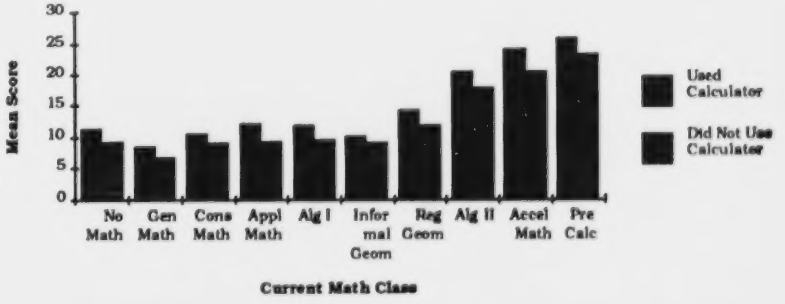


So the problem was not one of avoiding senior year math through a false perception of preparation. Students not enrolling for senior math by and large knew they had problems with mathematics.

Using calculators (See chart K)

One interesting result centers around the use of calculators on the test. No evidence indicates that a student would require a calculator to do this test, and about half those taking the MMEPT did not.

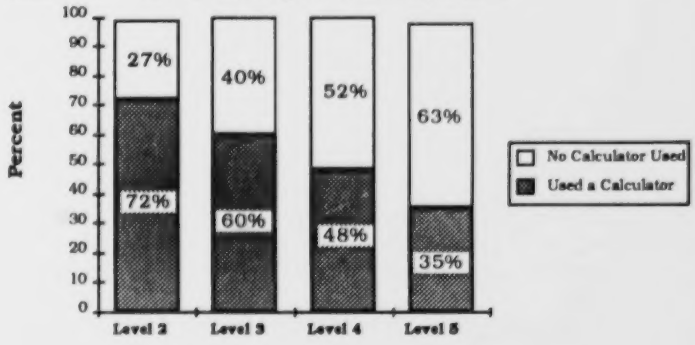
Chart K: **Mean Scores by Class And Calculator Usage**



However, those who used calculators averaged about 4 points higher in their results. One might speculate that this occurred simply because students more proficient in mathematics kept a calculator on hand. However, the calculator advantage occurred across all courses. Even those in lower level classes did better when they used calculators. This suggests some sort of causal link between use of a calculator and improved scores.

Chart L shows the relationship between calculator usage and test scores in a more striking way: 72 percent of the students placing at Level 2 on the test used a calculator, whereas only 35 percent of those placing in Level 5 used calculators. Note the remarkably linear relationship between placement levels and percentage of calculator usage: with each placement level increase, the percentage of students using calculators goes up about 12 points.

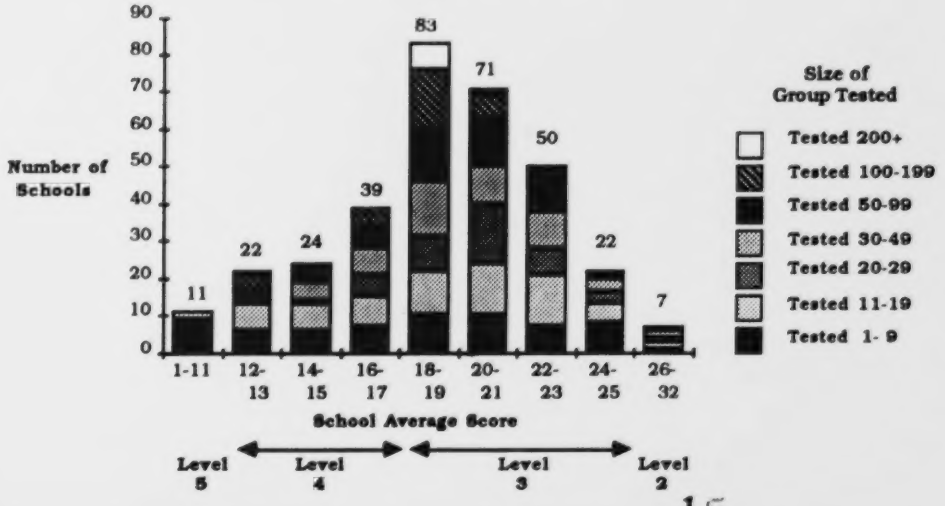
Chart L: Calculator Usage in Percent by Levels



School performance (See Chart M)

While the main purpose of the MMEPT is to provide information directly to individual students, it also offers a tool which schools can use to measure the effectiveness of their mathematics instruction. The MMEPT observes strict confidentiality regarding individual school information and does not make direct school comparisons because each school tests differing groups of students. However, the program has compiled some limited composite information so schools may compare their results against the overall outcome.

Chart M: Distribution of School Average Scores For Algebra II Students



In particular, this report focuses on the participating schools' Algebra II enrollees. Virtually every school tested Algebra II students, and over half the students tested were taking this course.

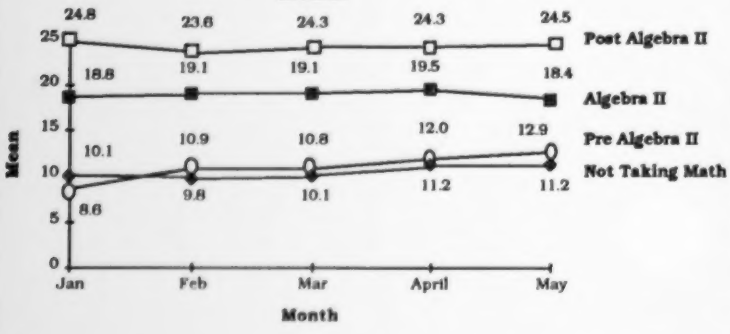
Chart M shows how testing schools' Algebra II students averaged on the MMEPT. This chart makes apparent a rather broad spread in these school averages. One feels particular concern to see Algebra II students at 29 percent of the schools averaging at remedial levels. Such schools should seriously consider raising their expectations for this class.

Interestingly, while the schools testing very small groups produced averages spread evenly across the range, those testing the very largest groups showed higher averages than the overall. At one such school where students scored well, the test coordinator said, "The test results support that the sequence of our math courses leads to college math."

Testing strategies

Schools adopted many strategies for using the MMEPT. Some schools tested only college-bound students or students enrolled in Algebra II. Other schools made a special effort to include students not enrolled in mathematics by testing all junior English or history students. Some schools tried to test in January or February to provide senior class registration advice to students; other schools waited until near completion of the junior year to obtain a year-end profile. All these strategies, of course, affected the final outcome for schools to some extent. While testing non-enrolled students might pull down a school's overall results, such schools performed the essential service of getting the MMEPT's message to those students who most need it.

Chart N: Mean Scores by Month



As it turned out, the time of administering the test between January and June made very little difference in score. Except for a small number of students whose tests were scored in June, the monthly Algebra II average scores remained quite flat. Scores also remained stable over this period for those not taking math and for those taking advanced math. Since the MMEPT focuses on arithmetic and early algebra skills, one should expect any monthly improvement to show up only for students studying these areas in pre-Algebra II classes. In fact the scores for pre-Algebra II students who took the MMEPT in May do average about two points higher than for those pre-Algebra II students taking the test in February. (See chart N)

The large majority of students, 73 percent, took the test in February or March. About 12 percent took it either in April or in May.

Item Analysis

Table O gives a listing with descriptions of the test items together with the percentage of the test-takers who answered the item correctly. These are listed in decreasing order of correct responses, which range from 81 percent to 34 percent.

While the percentage of correct responses all decreased from last year's limited pilot study by an average of 8.5 percentage points, only minor shifts appeared in the order.

The ranking of correct responses correlates reasonably well with the curriculum in that students more often miss questions on the more advanced topics. Exceptions occur, however. Too-casual reading rather than unfamiliarity with the percent concept must be one reason 40 percent of the students said that one-half percent of \$240 is \$120. Some deficiencies in simple problem solving skills may lie behind other anomalies: Although 62 percent of the students could correctly answer a straightforward percentage discount question, only 39 percent could rearrange the same concept to identify the list price of an item, given its sale price and the percent discount.

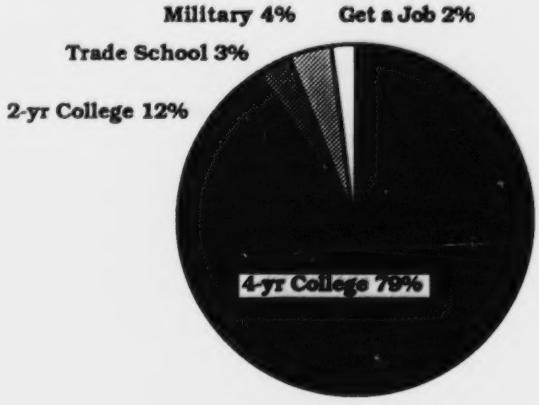
TABLE O

% Answered Correctly	Nature of Question
81	Solve $4 - x = -3$
80	Given $A = \frac{1}{2}bh$ formula, values for A and b, what is h
77	Identify the factors of a monic quadratic polynomial
74	Solve a linear equation requiring clearing of fractions
71	Evaluate a quadratic at a particular value
70	Pick out a sequence of decimal fractions that are in increasing order
69	Multiply a degree 1 by a degree 2 polynomial
67	Identify the middle coefficient in a product of two linear polynomials
67	A multiplication using scientific notation
65	Divide two powers of 10
63	Identify formula for circumference of a circle
62	Convert a Fahrenheit temp. to Celsius (Formula for F as a function of C given)
62	Identify the percent discount given list price and sale price
55	Do a simple "story problem" to find two numbers given their sum and difference
55	Use Pythagorean Theorem (Formula not given)
53	Distance rate time problem
52	Change a numerical fraction to get new denominator
51	Find the point of intersection of two lines given their equations
51	Simplify a linear expression in one variable with several levels of grouping
50	Simplify a difference of two square roots
48	Simplify a compound fraction with numbers
46	Manipulation of signed exponents problem
44	Find a root of a quadratic
43	Solve two linear equations simultaneously
43	Fraction nearest to 0.222
42	Identify slope of a line from its equation
40	Simplify a difference of two rational expressions
39	Solve a simple linear equation with fractions
39	Given the sale price and the percent discount, identify the list price
37	Evaluate a number with a negative exponent
36	Get the equation of a line given two points on it
34	$\frac{1}{2}$% of a whole number

A PROFILE OF THE STUDENTS

The figures show clearly schools focused the MMEPT on college bound students. Overall, 79 percent of the responding students taking the test intended to attend a four-year college or university and 12 percent a two-year college. A mere nine percent of those responding thought they would go into the military, go to a trade school or just find a job after leaving high school. (See chart P)

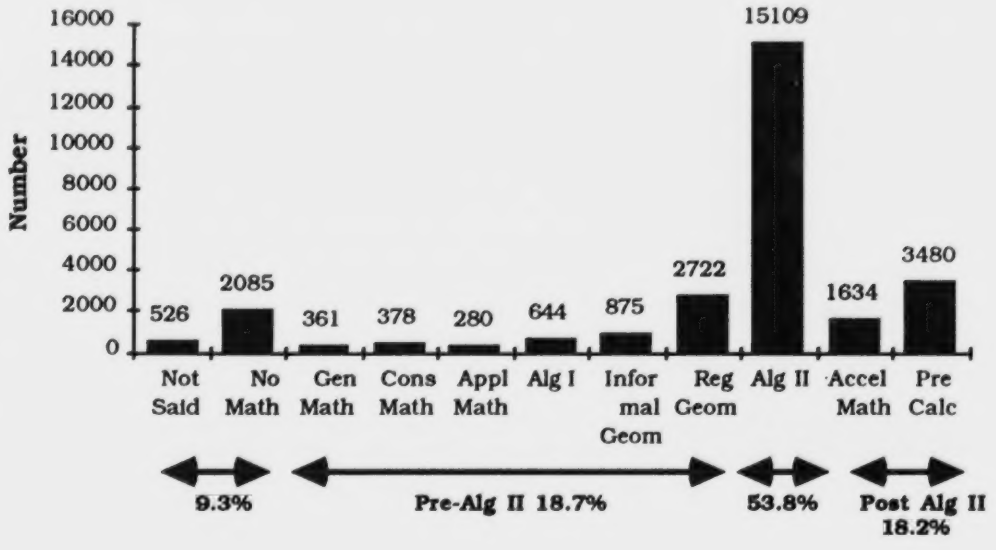
Chart P: Plans After High School



Math Class Enrollment

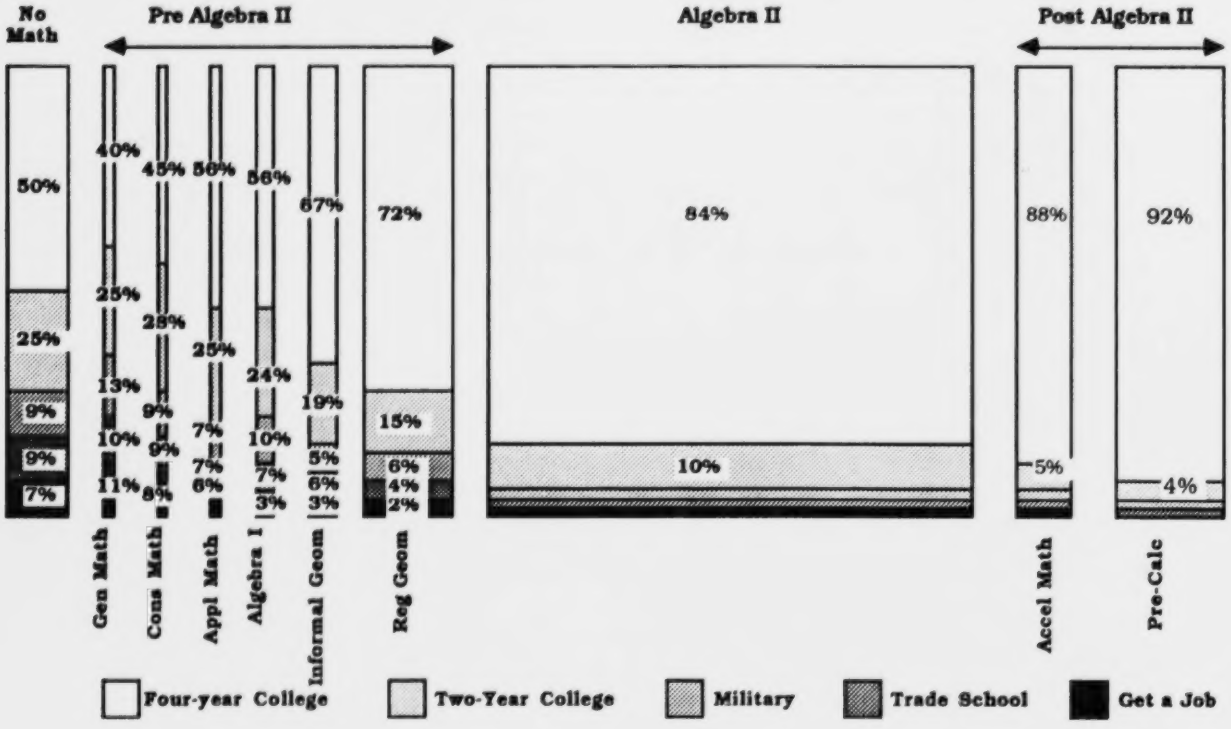
In most schools, college preparatory students take second-year algebra as juniors, so it comes as little surprise to see that 54 percent of those taking the MMEPT in 1987 were enrolled in Algebra II and 18 percent in higher level mathematics courses. Those not enrolled in a mathematics course accounted for just over 7 percent of the students. Two percent failed to provide information on enrollment. (See chart Q)

Chart Q: Current Math Class Frequencies



Taking math enrollment together with college plans, one sees that higher level enrollment correlated with higher aspirations. Nonetheless, even of those not taking a math course, 50 percent still hoped to attend a four-year college. For all students taking math courses of lesser content than Algebra II, 64 percent expressed intent to attend a four-year college. Attending a four-year college was the goal of 84 percent of the second-year algebra students and 91 percent of those students taking more advanced math courses. (See chart R)

Chart R: Post High School Plans By Current Math Class



Any other choices—training schools, two-year colleges, or simply getting a job—held less attraction for those with a stronger mathematics background. These responses raise the question: Do students turn away from mathematics thinking they won't need it, or do they settle for a given occupation because they lack the math preparation for anything else?

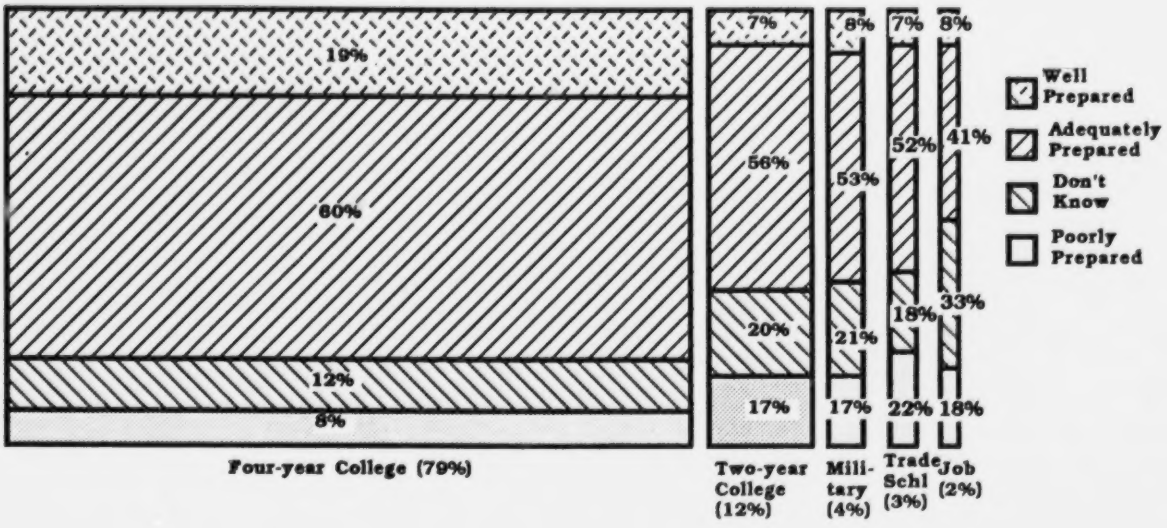
Self-perception

Some results from the background questions indicated students had a pretty fair idea of their background and were possibly choosing a course of least resistance. For example, the same people who saw themselves as poorly prepared in math were the least likely to sign up for a senior mathematics course.

Of those aiming to attend a four-year college, 19 percent said they felt well prepared in mathematics; 60 percent, adequately prepared; 12.5 percent weren't sure; and 8 percent, poorly prepared. For those people who planned to look for a job after high school, the self-perception became noticeably lower. Eight percent said they felt well prepared; 41 percent, adequately prepared; 33 percent weren't sure; and 18 percent, poorly prepared. (See chart S)

Chart S: Confidence vs. Post High School Plans

(In Percent)



Overall, 16 percent of the students responding said they felt well prepared in math, 59 percent said adequate, 14 percent said they didn't know, and 10 percent saw their preparation as poor. (See Chart T) While 71 percent of those responding said they planned to take senior mathematics, only 52 percent of those who saw themselves as poorly prepared planned to take mathematics the senior year. These were the very students who most needed to consider additional mathematics to enlarge their options. These students more than any others needed the information in the MMEPT student report letter. (See chart H)

For these students in particular, many teachers would agree with their colleague who told the MMEPT, "It was one of the most helpful programs we have participated in, as it reinforced our own recommendations and proved to the students they needed more math for college."

As results cited above indicated, these self-perceptions assessed the actual situation rather well. The respondents' current course enrollments also showed this. Those taking general pre-algebra mathematics or taking no math course at all were most apt to feel poorly prepared and the least likely to feel adequately prepared.

Chart T: Students' Confidence in Their Math Preparation

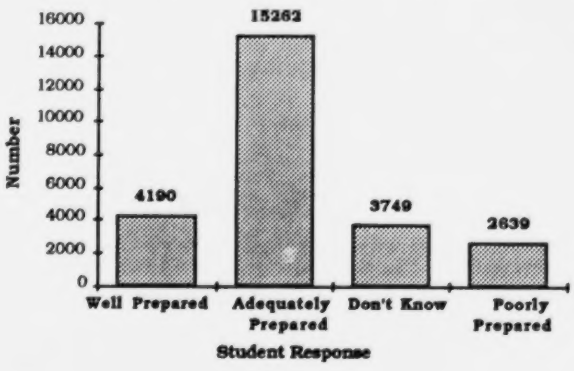
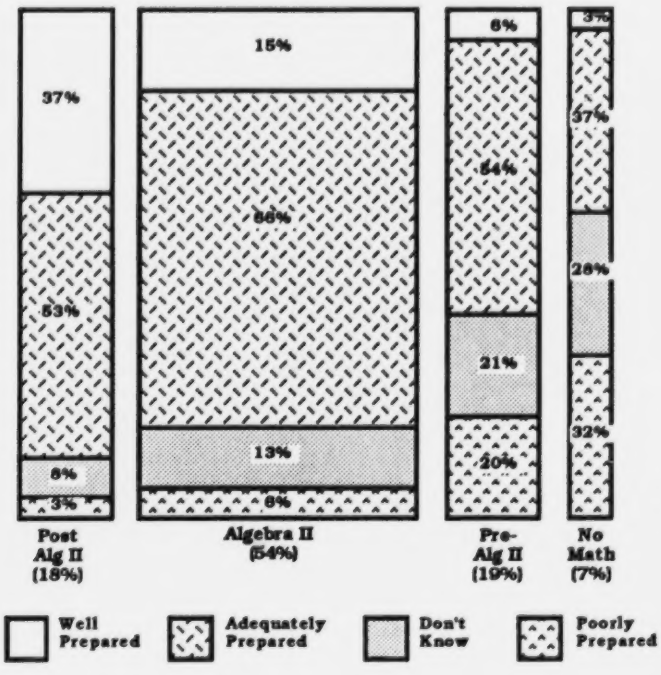


Chart U: Confidence in Preparation By Current Math Class Group



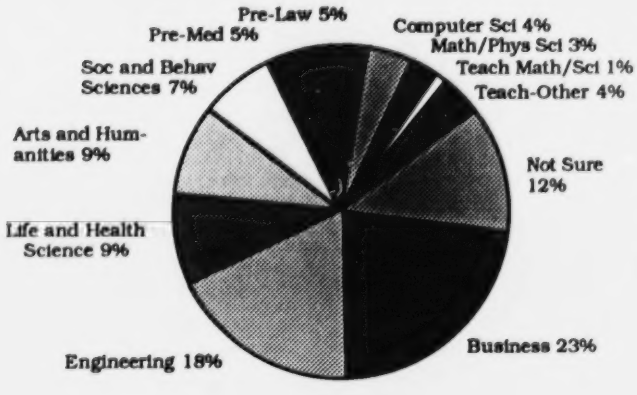
A comparison of Algebra II students to all students enrolled in math at a lower level and to all those enrolled at a higher level produced the perceptions one would expect. Those not taking math were least likely to see themselves as well prepared and most likely to think they were poorly prepared. Likewise, those taking advanced courses were most likely to see themselves as well prepared. (See chart U)

College plans

What did MMEPT students think they would study it they attended college? Engineering and business and management were far and away the most popular aspirations. Nearly 40 percent of the respondents aimed toward these two areas of study. Distantly behind came life and health sciences and the arts and humanities. Even those few who gave some other field as a first choice often gave business and management as a second choice. Teaching was a profession attracting little interest. (See charts V and W)

Certain courses of study appeared to attract those deficient or relatively weak in mathematics. In particular, those aimed toward the arts and humanities, law, health-related professions, social sciences and teaching (non-math) were more likely to see their preparation as uncertain to poor. (See chart X)

Chart V: College Major Choices



Of interest to admissions officers is the information on who will study what and where. Those aiming toward medicine and law overwhelmingly chose the four-year universities. Business aspirants also aimed toward the four-year schools. Those who showed some preference for two-year schools and trade schools included life and health science, computer science, business and engineering students. (See chart Y)

Chart W: **Second Choices of College Majors Over First Choices of Majors**

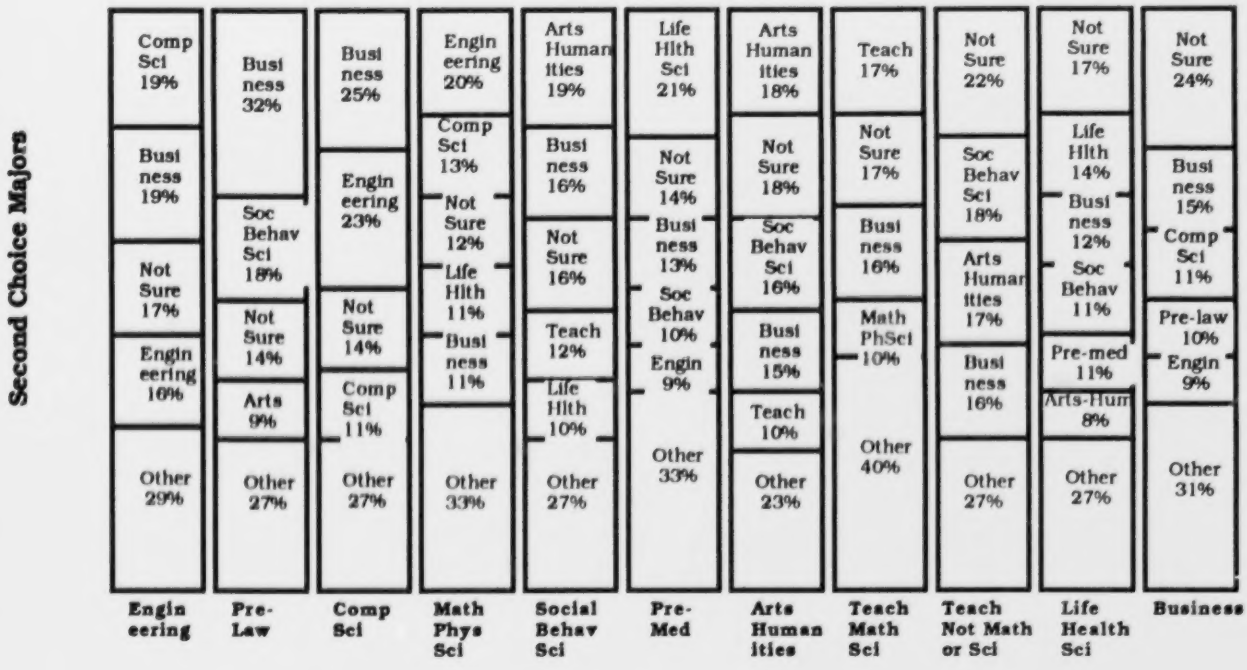


Chart X: **Confidence in Preparation vs. Likely College Major (In Percent)**

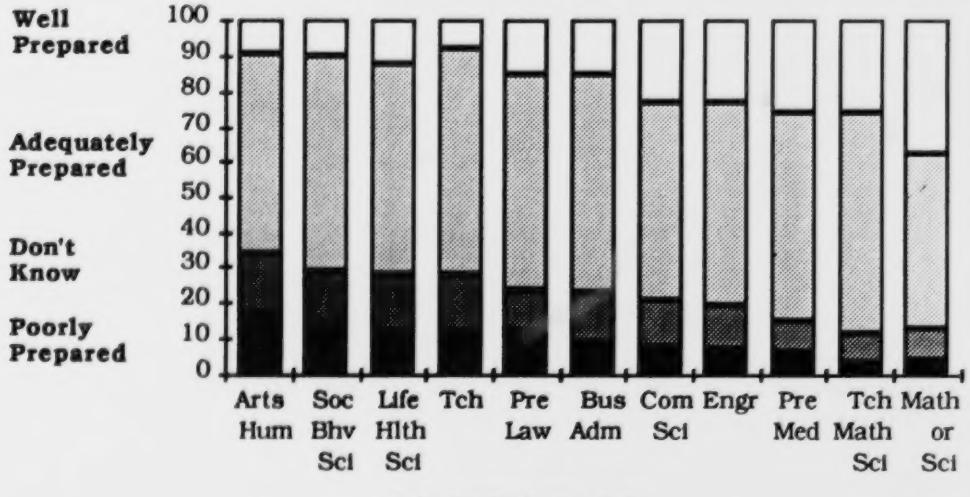
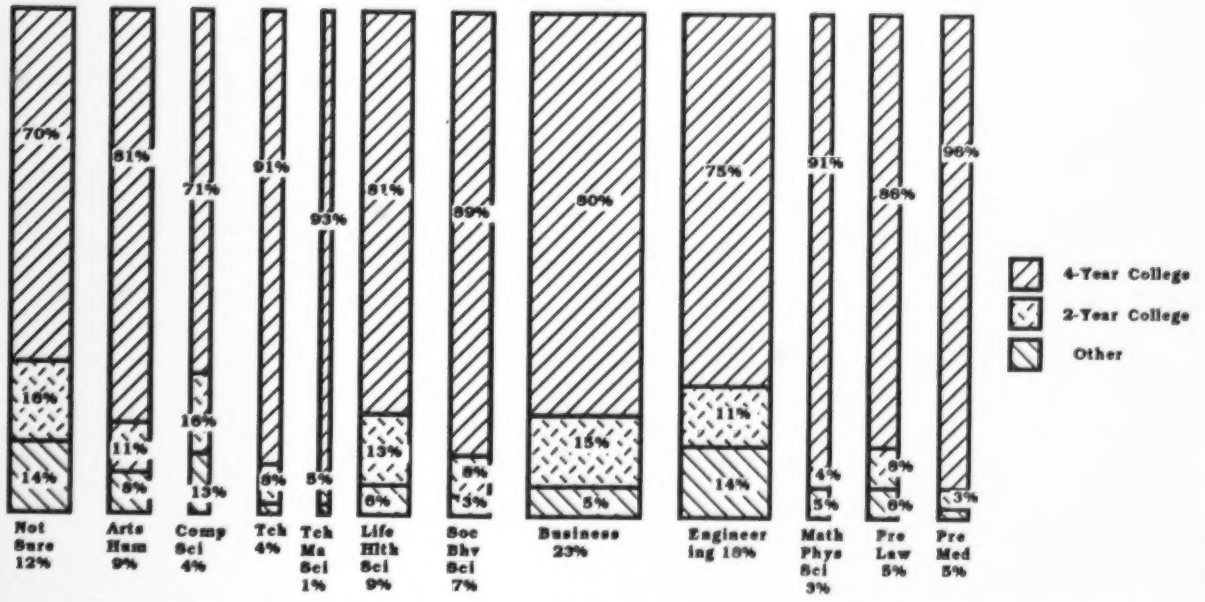


Chart Y:

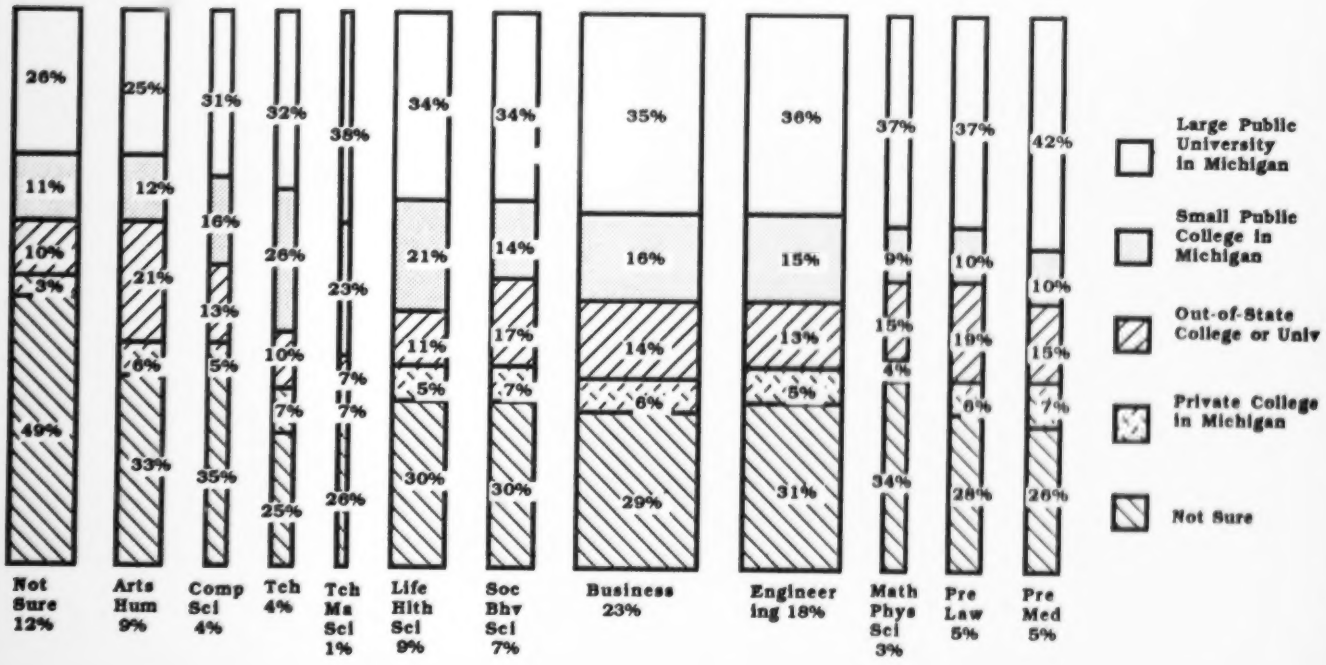
Post High School Plans vs Choice of Major



Many life and health science students, as well as those interested in teaching and business, would also go to small public colleges, indicating a focus here for community colleges. Students interested in arts and humanities showed the largest preference for attending school out of state or small institutions. Nearly a quarter of them intended to leave the state. (See chart Z)

Chart Z:

Type of College Choices By Likely Major



SCHOOL REACTION

The MMEPT program sent each of the 345 schools who administered the Michigan Mathematics Early Placement Test a questionnaire to gain reactions to the test. In all, 86 schools responded, providing input in six main areas: General reaction, how schools use the results, how the MMEPT affects schools who use it, how the MMEPT affects the students who take it, how schools use the test to influence their younger students, and ways to improve the MMEPT.

General reactions

Ninety-four percent of the responding schools gave explicitly positive reactions; only one school reacted unfavorably. As to meeting its purpose, 91 percent of the respondents felt the test did direct students' attention toward the importance of mathematics in their college plans; one school felt it did not serve this purpose. Interestingly, a quarter of the schools responding mentioned the favorable reaction of their students to the test. One teacher polled his students after taking the MMEPT and found 84 percent of them hoped their school would continue using the test. In fact, 93 percent of the responding programs have already indicated they hope to offer the MMEPT next year; only two math departments will recommend against participation.

How schools are using the results

The form included a list of ways schools might use the MMEPT results and asked respondents to check as many as applied. The results were as follows:

72%	(62 respondents)	For student counseling
65	(56)	For classroom discussion
15	(13)	As a basis for parent discussions
12	(10)	To predict students' subsequent course placement
10	(9)	To direct students at class registration time
8	(7)	Report overall results in parent newsletters
7	(6)	When given by math department, sharing results with counselors
5	(4)	When given by counseling department, sharing results with math department

In addition, 14 percent of the respondents reported they will use results to evaluate their school math programs. Ten percent will go a step further and use results to embark on curriculum improvements.

One school reported, "It reinforced plans to rework the 11th-12th grade math curriculum to help in preparation for college math," while another reported, "We will use the results to improve our math sequence and add an advanced course."

The impact on students

Forty-six respondents, more than half, believed that MMEPT results would cause students to take additional math courses in their senior year. These respondents estimated anywhere from 2 percent to 100 percent of their students would sign up for more math. One school commented that 15 percent of its juniors might repeat second-year algebra as a result of the MMEPT.

In other responses, 21 percent of respondents commented the MMEPT provides students with solid information about their math abilities and requirements, both for high school and later education. While a few respondents worried the results might discourage students about math studies, over half were indicating the test would provide a positive incentive at registration time.

How schools reach younger students

It is clear that serious attention to mathematics should begin before the middle of the junior year, and the MMEPT questionnaire asked how schools were using test results to motivate their younger students.

At two schools juniors who had taken the MMEPT talked to freshmen and sophomores about the test results and the importance of math. One teacher found that fully 76 percent of his students believed after taking the MMEPT that the results would prove most helpful to such younger students.

At three other schools the teachers specifically mentioned talking to freshmen and sophomores about the MMEPT results to encourage them to stay with their math courses.

The MMEPT staff hopes to be able to encourage more such usage of MMEPT results.

Some Further Comments from Michigan Teachers

* "This is an excellent program, because more communication is needed between colleges and high schools on what math and science should be taught at the high-school level."

* "I like the report. It helps me to tell students the important facts about their preparation for college that they need to know."

* "The price is right! We finally have a good tool at no cost."

* "Excellent program. Please continue it next year! Now we need something in other areas, such as English."

* "This test result, more than other tests, tells students where they place. It gives them feedback about themselves that is useful."

* "You could have heard a pin drop as the students sat reading their letters. We think the MMEPT is excellent and extremely helpful to us all."

* "Excellent test; very useful and thorough feedback. I was definitely impressed, inspired, and excited to get results into students' hands. It should also show [younger students] the importance of mastering algebra and keeping accurate in arithmetic. The value of math should also be clearer to them at the younger ages as the school consistently uses this exam."

* "We have begun stressing more math by offering algebra a year earlier to selected students."

THE MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

A Program of The Presidents Council of State Colleges & Universities

FEB 04, 1987

KATHLEEN
HIGH SCHOOL
MI

DEAR KATHLEEN

THIS IS A REPORT ON HOW YOU DID ON THE MATH EARLY PLACEMENT TEST YOU TOOK A FEW WEEKS AGO. YOUR RESULTS ARE AS FOLLOWS:

TEST SCORE: 28
PLACEMENT LEVEL: 2

THE MAXIMUM TEST SCORE IS 32. THE PLACEMENT LEVELS RANGE FROM 2 (THE HIGHEST) TO 5 (THE LOWEST). ON THE BACK OF THIS PAGE YOU WILL FIND AN EXPLANATION OF THE SYSTEM OF LEVELS.

YOUR PLACEMENT LEVEL OF 2 MEANS THAT IF YOU WERE ENTERING COLLEGE RIGHT NOW, YOU WOULD LIKELY BE PLACED INTO A COURSE THAT IS JUST ONE STEP BELOW A CALCULUS COURSE. (IF YOU FOUND THIS TEST EASY, YOU MAY BE AMONG THE BEST PREPARED JUNIORS WHO ARE READY NOW FOR CALCULUS, BUT THIS TEST IS NOT DESIGNED TO TELL THAT.) LEVEL 2 IS A GOOD PLACE FOR A JUNIOR TO BE. IT MEANS THAT YOU ARE WELL ON TRACK IN PREPARING FOR COLLEGE. IF YOU TAKE YOUR HIGH SCHOOL'S ADVANCED SENIOR MATHEMATICS COURSE AND DO WELL IN IT, YOU WILL BE READY TO PROGRESS WITHOUT DELAY INTO COLLEGE PROGRAMS WHICH REQUIRE ADVANCED MATHEMATICS.

ON YOUR TEST FORM, YOU INDICATED THE FOLLOWING AS SUBJECTS YOU MAY BE INTERESTED IN STUDYING IN COLLEGE:

FIRST CHOICE: ENGINEERING
SECOND CHOICE: MATH/PHYSICAL SCI

IF YOU PLAN TO STUDY ENGINEERING, YOU WILL NEED AN EXCELLENT MATHEMATICAL BACKGROUND UPON ENTERING COLLEGE SINCE PRACTICALLY ALL PROGRAMS REQUIRE AN ENTIRE SEQUENCE OF CALCULUS COURSES ALONG WITH DIFFERENTIAL EQUATIONS, LINEAR ALGEBRA AND STATISTICS. IN ADDITION, A LARGE PROPORTION OF ENGINEERING DISCIPLINES REQUIRE COURSES IN COMPLEX ANALYSIS, NUMERICAL ANALYSIS AND ADVANCED DIFFERENTIAL EQUATIONS.

OF ALL THE DISCIPLINES THAT MAKE USE OF MATHEMATICS, THE PHYSICAL SCIENCES RANK HIGHEST. THIS IS BECAUSE MATHEMATICS PROVIDES THE LANGUAGE IN WHICH THE LAWS OF SCIENCE ARE EXPRESSED. IF YOU MAJOR IN A PHYSICAL SCIENCE, YOU WILL NEED TO STUDY PLENTY OF COLLEGIATE MATHEMATICS, BEGINNING WITH CALCULUS AND CONTINUING WITH SEVERAL SPECIALIZED COURSES DEPENDENT ON YOUR MAJOR. A MATHEMATICS MAJOR WILL REQUIRE EVEN MORE COURSES BEYOND CALCULUS.

ON THE BACK OF THIS LETTER IS MORE INFORMATION ABOUT THE TEST. HAVE A GOOD YEAR NEXT YEAR AS A HIGH SCHOOL SENIOR AND MAKE A MATH COURSE PART OF THAT YEAR. IT IS IMPORTANT FOR YOU TO REMEMBER THAT A SOLID FOUNDATION IN MATHEMATICS KEEPS THE DOORS OF OPPORTUNITY OPEN.

SINCERELY,
JOHN O. KILTINEN, MMEPT DIRECTOR

BACKGROUND INFORMATION
For Students Who Have Taken The
MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

The Purpose of the Test

The Michigan Mathematics Early Placement Test (MMEPT) is very similar to the mathematics placement test you probably will take when you enroll in a college or a university. These tests help to determine what mathematics course you are ready to take. The MMEPT gives you an early indication of how things are going in terms of math preparation as you ready yourself for college. It tells you approximately where you would start if you were entering college now.

Why is the MMEPT necessary?

Many high school students are not adequately aware of how important a solid background in mathematics is for being successful in college studies. They often do not realize how much mathematics they will be expected to know for the subject they have chosen as a major. Consequently, they do not take enough mathematics in high school or do not put forth enough effort to learn in courses they do take. The result is that an alarming number of students are coming to college inadequately prepared. In recent years, at several of Michigan's universities, over 40% of those enrolled in courses in which freshmen can begin have been taking remedial courses - studying material readily available in most high schools.

The MMEPT has been developed as one means to address this problem. The Presidents Council and the MMEPT Committee hope that the information you get from taking the MMEPT will guide you in using your senior year in high school to the fullest advantage in preparing yourself for college.

What do the placement levels mean?

The MMEPT gives students a placement level from 2 to 5 with 2 being the highest. There is also a level 1 in the system, but the test is not designed to tell if you are at level one. The levels have the following meanings:

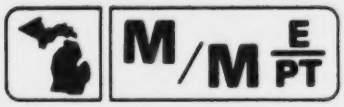
Level 1	Ready for a calculus course (Not tested by the MMEPT)
Level 2	Ready for a pre-calculus course (Topics like logarithmic, exponential and trig functions, analytic geometry, etc.).
Level 3	Ready for college algebra.
Level 4	Below college level. Need intermediate algebra.
Level 5	Farther below college level. Need a refresher in arithmetic and beginning algebra.

Levels 1 through 3 are regarded as "college level". Those entering highly technical fields such as engineering or science should enter college at level 1 in order to progress normally. Those in less technical fields such as political science or elementary education can progress well if they enter at level 3. Levels 4 and 5 are remedial ones. Those who enter at these levels must take mathematics at the high school level and even lower if they are to be made ready for the college math their program may require. This will cause delays, cost extra money and close some doors of opportunity.

A final word about your senior year

You have heard the expression "Use it or lose it!" This is definitely true of mathematical skill. If you do not keep in practice with mathematics, your ability to use it will surely decline. For that reason, it is very important that you take a mathematics course each semester of your senior year. If you do not, you can expect that your placement level will decline between now and when you are ready for college.

If you are satisfied with your placement score right now, do not take this as a sign that you can relax and safely lay off of mathematics during your senior year. You must keep up with your math in order to hold, and we hope improve, your placement level. If you are not satisfied with your level, you have even more reason to take mathematics in your senior year. You will want to seek the advice of your math teacher and counselor on what is the best course to take.



THE MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

A Program of The Presidents Council of State Colleges & Universities

FEB 04, 1987

PHILIP
HIGH SCHOOL
MI

DEAR PHILIP

THIS IS A REPORT ON HOW YOU DID ON THE MATH EARLY PLACEMENT TEST YOU TOOK A FEW WEEKS AGO. YOUR RESULTS ARE AS FOLLOWS:

TEST SCORE: 20
PLACEMENT LEVEL: 3

THE MAXIMUM TEST SCORE IS 32. THE PLACEMENT LEVELS RANGE FROM 2 (THE HIGHEST) TO 5 (THE LOWEST). ON THE BACK OF THIS PAGE YOU WILL FIND AN EXPLANATION OF THE SYSTEM OF LEVELS.

YOUR PLACEMENT LEVEL OF 3 MEANS THAT IF YOU WERE ENTERING COLLEGE RIGHT NOW, YOU WOULD LIKELY BE PLACED IN A COURSE IN COLLEGE ALGEBRA OR A COURSE AT THE SAME LEVEL DESIGNED TO MEET THE NEEDS OF STUDENTS IN PARTICULAR PROGRAMS. THIS COURSE WOULD OVERLAP TO A GREAT EXTENT WITH A HIGH SCHOOL ALGEBRA II COURSE, AND MANY STUDENTS WHO ENTER COLLEGE WITH A SOLID HIGH SCHOOL MATHEMATICS BACKGROUND CAN BYPASS IT AND GET RIGHT ON TO HIGHER LEVEL COURSES REQUIRED IN THEIR PROGRAMS. FOR STUDENTS GOING INTO MOST NONTECHNICAL MAJORS, ENTERING COLLEGE AT PLACEMENT LEVEL 3 WILL LIKELY NOT PROLONG THEIR TIME TO GETTING A DEGREE. HOWEVER, FOR FIELDS SUCH AS ENGINEERING, COMPUTER SCIENCE OR PRE-MEDICINE WHICH REQUIRE MUCH MATHEMATICS, STUDENTS ENTERING AT LEVEL 3 CAN EXPECT DELAYS IN THEIR PROGRESS.

OF COURSE, YOU ARE NOT ENTERING COLLEGE RIGHT NOW. YOU HAVE THE UPPORTUNITY DURING YOUR SENIOR YEAR TO TAKE MORE MATHEMATICS AND RAISE YOUR PLACEMENT LEVEL. WHY NOT TALK TO YOUR COUNSELOR OR MATH TEACHER ABOUT THE APPROPRIATE COURSE TO TAKE?

ON YOUR TEST FORM, YOU INDICATED THE FOLLOWING AS SUBJECTS YOU MAY BE INTERESTED IN STUDYING IN COLLEGE:

FIRST CHOICE: COMPUTER SCI
SECOND CHOICE: BUSINESS ADMIN

COMPUTER SCIENCE PROGRAMS IN COLLEGES AND UNIVERSITIES ARE RIGOROUS PROGRAMS AND REQUIRE SUBSTANTIAL MATHEMATICS. AS A COMPUTER SCIENCE MAJOR, YOU ARE GENERALLY REQUIRED TO COMPLETE A SEQUENCE OF CALCULUS COURSES ALONG WITH COURSES IN PROBABILITY, LINEAR ALGEBRA AND DISCRETE MATHEMATICS. SPECIALIZED ADVANCED MATHEMATICAL TOPICS ARE INCORPORATED IN MANY COMPUTER SCIENCE COURSES.

BUSINESS MAJORS MUST BE MATHEMATICALLY PREPARED SINCE THEY WILL BE REQUIRED TO TAKE DECISION THEORY COURSES SUCH AS FINITE MATHEMATICS, STATISTICS, PROBABILITY AND OPERATIONS RESEARCH. AS A BUSINESS MAJOR AT MANY COLLEGES AND UNIVERSITIES, YOU WILL ALSO NEED TO TAKE ONE OR TWO SEMESTERS OF CALCULUS AND, DEPENDING ON YOUR AREA OF CONCENTRATION, DIFFERENTIAL EQUATIONS AND MATHEMATICAL MODELING COURSES MAY ALSO BE REQUIRED.

ON THE BACK OF THIS LETTER IS MORE INFORMATION ABOUT THE TEST. HAVE A GOOD YEAR NEXT YEAR AS A HIGH SCHOOL SENIOR AND MAKE A MATH COURSE PART OF THAT YEAR. IT IS IMPORTANT FOR YOU TO REMEMBER THAT A SOLID FOUNDATION IN MATHEMATICS KEEPS THE DOORS OF OPPORTUNITY OPEN.

SINCERELY,
JOHN O. KILTINEN, MMEPT DIRECTOR

Administered by The Seaborg Center Northern Michigan University Marquette, MI 49855 (906) 227-2274 (227-C'BRG)

THE MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

A Program of The Presidents Council of State Colleges & Universities

FEB 04, 1987

MELANIE
HIGH SCHOOL
MI

DEAR MELANIE

THIS IS A REPORT ON HOW YOU DID ON THE MATH EARLY PLACEMENT TEST YOU TOOK A FEW WEEKS AGO. YOUR RESULTS ARE AS FOLLOWS:

TEST SCORE: 13
PLACEMENT LEVEL: 4

THE MAXIMUM TEST SCORE IS 32. THE PLACEMENT LEVELS RANGE FROM 2 (THE HIGHEST) TO 5 (THE LOWEST). ON THE BACK OF THIS PAGE YOU WILL FIND AN EXPLANATION OF THE SYSTEM OF LEVELS.

YOUR PLACEMENT LEVEL OF 4 MEANS THAT IF YOU WERE ENTERING COLLEGE RIGHT NOW, YOU WOULD LIKELY HAVE TO TAKE A COURSE IN INTERMEDIATE ALGEBRA BEFORE BEING ADMITTED INTO THE MATHEMATICS COURSES WHICH YOUR PROGRAM MAY REQUIRE. THIS COURSE MAY NOT CARRY CREDIT TOWARD GRADUATION, WILL POSSIBLY ADD TO THE TIME IT TAKES TO COMPLETE A DEGREE, AND WILL CERTAINLY ADD TO THE EXPENSE.

BUT, OF COURSE, YOU ARE NOT BEGINNING COLLEGE NOW. YOU STILL HAVE YOUR SENIOR YEAR TO IMPROVE YOUR LEVEL. WHY NOT ASK YOUR COUNSELOR OR MATH TEACHER ABOUT THE BEST COURSE TO HELP YOU DO THAT?

ON YOUR TEST FORM, YOU INDICATED THE FOLLOWING AS SUBJECTS YOU MAY BE INTERESTED IN STUDYING IN COLLEGE:

FIRST CHOICE: TEACH: NOT MATH/SCI
SECOND CHOICE: BUSINESS ADMIN

SINCE EDUCATION IS A FIELD WHICH RELIES HEAVILY ON STATISTICS TO EVALUATE PROGRAMS, YOUR EDUCATION COURSEWORK WILL INCORPORATE SOME STATISTICS. IF YOU PLAN TO TEACH AT THE ELEMENTARY SCHOOL LEVEL, YOU WILL REALIZE THAT TEACHERS OF ELEMENTARY SCHOOL CHILDREN ARE MATHEMATICS TEACHERS ALSO. A THOROUGH UNDERSTANDING OF ELEMENTARY MATHEMATICS IS ESSENTIAL, AND COURSES IN MATHEMATICS WILL BE PART OF YOUR PREPARATION FOR A TEACHING CAREER. A FIRM GRASP OF ELEMENTARY ALGEBRA IS NEEDED FOR THE COURSES YOU WILL TAKE.

BUSINESS MAJORS MUST BE MATHEMATICALLY PREPARED SINCE THEY WILL BE REQUIRED TO TAKE DECISION THEORY COURSES SUCH AS FINITE MATHEMATICS, STATISTICS, PROBABILITY AND OPERATIONS RESEARCH. AS A BUSINESS MAJOR AT MANY COLLEGES AND UNIVERSITIES, YOU WILL ALSO NEED TO TAKE ONE OR TWO SEMESTERS OF CALCULUS AND, DEPENDING ON YOUR AREA OF CONCENTRATION, DIFFERENTIAL EQUATIONS AND MATHEMATICAL MODELING COURSES MAY ALSO BE REQUIRED.

ON THE BACK OF THIS LETTER IS MORE INFORMATION ABOUT THE TEST. HAVE A GOOD YEAR NEXT YEAR AS A HIGH SCHOOL SENIOR AND MAKE A MATH COURSE PART OF THAT YEAR. IT IS IMPORTANT FOR YOU TO REMEMBER THAT A SOLID FOUNDATION IN MATHEMATICS KEEPS THE DOORS OF OPPORTUNITY OPEN.

SINCERELY,
JOHN O. KILTINEN, MMEPT DIRECTOR

Administered by The Seaborg Center Northern Michigan University Marquette, MI 49855 (906) 227-2274 (227-C'BRG)

THE MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

A Program of The Presidents Council of State Colleges & Universities

FEB 04, 1987

KELLEY
HIGH SCHOOL
MI

DEAR KELLEY

THIS IS A REPORT ON HOW YOU DID ON THE MATH EARLY PLACEMENT TEST YOU TOOK A FEW WEEKS AGO. YOUR RESULTS ARE AS FOLLOWS:

TEST SCORE: 9
PLACEMENT LEVEL: 5

THE MAXIMUM TEST SCORE IS 32. THE PLACEMENT LEVELS RANGE FROM 2 (THE HIGHEST) TO 5 (THE LOWEST). ON THE BACK OF THIS PAGE YOU WILL FIND AN EXPLANATION OF THE SYSTEM OF LEVELS.

YOUR PLACEMENT LEVEL OF 5 MEANS THAT IF YOU WERE ENTERING COLLEGE RIGHT NOW, YOU WOULD LIKELY BE PLACED IN A PRE-ALGEBRA COURSE. THIS COURSE PROVIDES A REVIEW OF ARITHMETIC AND BEGINNING ALGEBRA. FROM A COLLEGE PERSPECTIVE, IT IS A REMEDIAL LEVEL COURSE, AND AT MOST SCHOOLS, IT DOES NOT EARN YOU CREDIT TOWARD GRADUATION. IT PREPARES YOU FOR AN INTERMEDIATE ALGEBRA COURSE (ALSO REMEDIAL) WHICH PREPARES YOU FOR THE COLLEGIATE LEVEL MATHEMATICS WHICH YOUR PROGRAM MAY REQUIRE. CLEARLY STARTING COLLEGE AT LEVEL 5 IS GOING TO ADD TO THE TIME AND MONEY IT TAKES TO GET A DEGREE. THIS MAY PUT SOME FIELDS OF STUDY OF INTEREST TO YOU OUT OF REACH.

BUT, OF COURSE, YOU ARE NOT BEGINNING COLLEGE NOW. YOU STILL HAVE YOUR SENIOR YEAR IN HIGH SCHOOL IN WHICH TO TAKE A MATHEMATICS COURSE AND IMPROVE YOUR PLACEMENT LEVEL. TALK TO YOUR COUNSELOR OR MATH TEACHER ABOUT WHAT WOULD BE THE BEST COURSE FOR YOU. TAKE THE COURSE, AND REALLY WORK AT IT. THE PAYOFF WILL BE VERY REAL (IN TERMS OF DOLLARS, TIME, AND BROADENED OPPORTUNITY) WHEN YOU GET TO COLLEGE.

ON YOUR TEST FORM, YOU INDICATED THE FOLLOWING AS SUBJECTS YOU MAY BE INTERESTED IN STUDYING IN COLLEGE:

FIRST CHOICE: BUSINESS ADMIN
SECOND CHOICE: BUSINESS ADMIN

BUSINESS MAJORS MUST BE MATHEMATICALLY PREPARED SINCE THEY WILL BE REQUIRED TO TAKE DECISION THEORY COURSES SUCH AS FINITE MATHEMATICS, STATISTICS, PROBABILITY AND OPERATIONS RESEARCH. AS A BUSINESS MAJOR AT MANY COLLEGES AND UNIVERSITIES, YOU WILL ALSO NEED TO TAKE ONE OR TWO SEMESTERS OF CALCULUS AND, DEPENDING ON YOUR AREA OF CONCENTRATION, DIFFERENTIAL EQUATIONS AND MATHEMATICAL MODELING COURSES MAY ALSO BE REQUIRED.

ON THE BACK OF THIS LETTER IS MORE INFORMATION ABOUT THE TEST. HAVE A GOOD YEAR NEXT YEAR AS A HIGH SCHOOL SENIOR AND MAKE A MATH COURSE PART OF THAT YEAR. IT IS IMPORTANT FOR YOU TO REMEMBER THAT A SOLID FOUNDATION IN MATHEMATICS KEEPS THE DOORS OF OPPORTUNITY OPEN.

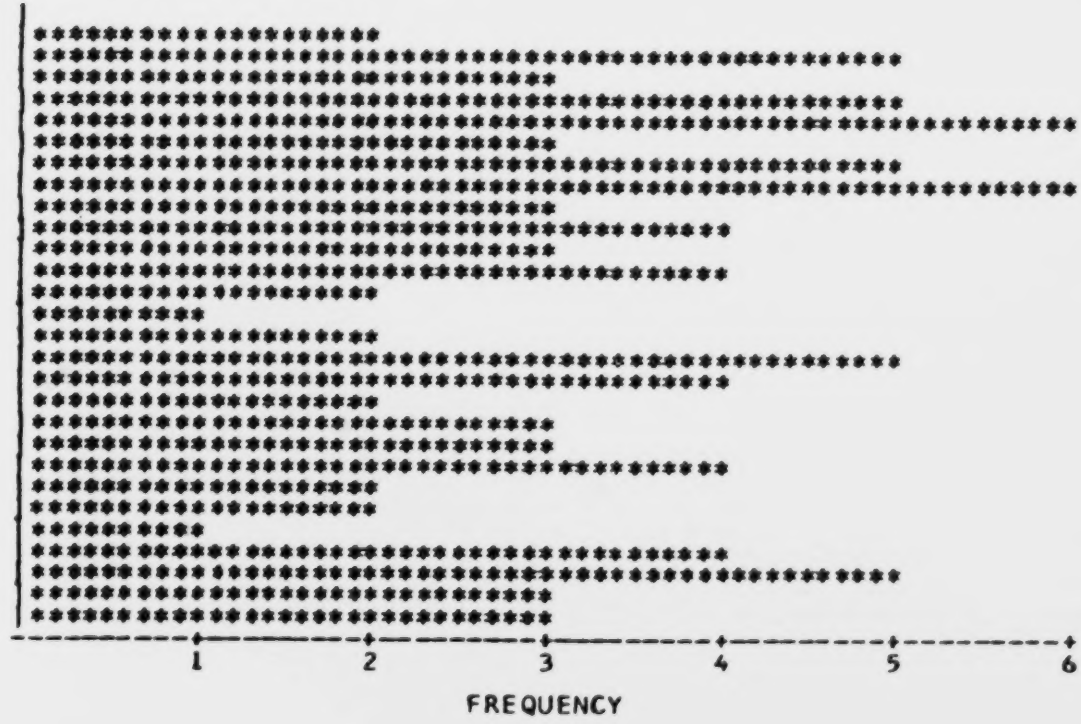
SINCERELY,
JOHN O. KILTINEN, MMEPT DIRECTOR

Administered by The Seaborg Center Northern Michigan University Marquette, MI 49855 (906) 227-2274 (227-C'BRG)

TABLE 1
MICHIGAN MATHEMATICS EARLY PLACEMENT TEST FOR 1987
HIGH SCHOOL
HISTOGRAM OF STUDENT SCORES

15:14 THURSDAY,

FREQUENCY BAR CHART



SCORE	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
4	2	2	2.11	2.11
5	5	7	5.26	7.37
6	3	10	3.16	10.53
7	5	15	5.26	15.79
8	6	21	6.32	22.11
9	3	24	3.16	25.26
10	5	29	5.26	30.53
11	6	35	6.32	36.84
12	3	38	3.16	40.00
13	4	42	4.21	44.21
14	3	45	3.16	47.37
15	4	49	4.21	51.58
16	2	51	2.11	53.68
17	1	52	1.05	54.74
18	2	54	2.11	56.84
19	5	59	5.26	62.11
20	4	63	4.21	66.32
21	2	65	2.11	68.42
22	3	68	3.16	71.58
23	3	71	3.16	74.74
24	4	75	4.21	78.95
25	2	77	2.11	81.05
26	2	79	2.11	83.16
27	1	80	1.05	84.21
28	4	84	4.21	88.42
29	5	89	5.26	93.68
30	3	92	3.16	96.84
31	3	95	3.16	100.00

TABLE 3
MICHIGAN MATHEMATICS EARLY PLACEMENT TEST FOR 1987
HIGH SCHOOL
CROSSTABULATION OF CURRENT MATH CLASS BY PLACEMENT LEVEL

TABLE OF MATH BY LEVEL

MATH LEVEL

FREQUENCY PERCENT ROW PCT COL PCT	LEVEL-2	LEVEL-3	LEVEL-4	LEVEL-5	TOTAL
GEN MATH,PRE-ALG	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	3 3.16 100.00 8.57	3 3.16
CONSUMER MA	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 1.05 100.00 2.86	1 1.05
ALGEBRA I	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 1.05 33.33 5.88	2 2.11 66.67 5.71	3 3.16
REGULAR GEOMETRY	0 0.00 0.00 0.00	0 0.00 0.00 0.00	2 2.11 33.33 11.76	4 4.21 66.67 11.43	6 6.32
ALGEBRA II	6 6.32 35.29 33.33	9 9.47 52.94 36.00	0 0.00 0.00 0.00	2 2.11 11.76 5.71	17 17.89
ACCELERATED MA	1 1.05 11.11 5.56	7 7.37 77.78 28.00	1 1.05 11.11 5.88	0 0.00 0.00 0.00	9 9.47
PRE-CALC,ANALYS	10 10.53 76.92 55.56	3 3.16 23.08 12.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	13 13.68
NOT ENROLLED	1 1.05 2.50 5.56	6 6.32 15.00 24.00	12 12.63 30.00 70.59	21 22.11 52.50 60.00	40 42.11
NOT STATED	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 1.05 33.33 5.88	2 2.11 66.67 5.71	3 3.16
TOTAL	18 18.95	25 26.32	17 17.89	35 36.84	95 100.00

TABLE 4
MICHIGAN MATHEMATICS EARLY PLACEMENT TEST FOR 1987
HIGH SCHOOL
CROSSTABULATION OF EXPECTED COLLEGE MAJOR BY PLACEMENT LEVEL

TABLE OF MAJOR BY LEVEL

MAJOR LEVEL

FREQUENCY PERCENT ROW PCT COL PCT	LEVEL-2	LEVEL-3	LEVEL-4	LEVEL-5	TOTAL
BUSINESS ADMIN	2 2.11 16.67 11.11	3 3.16 25.00 12.00	3 3.16 25.00 17.65	4 4.21 33.33 11.43	12 12.63
COMPUTER SCI	1 1.05 25.00 5.56	0 0.00 0.00 0.00	1 1.05 25.00 5.88	2 2.11 50.00 5.71	4 4.21
ENGINEERING	9 9.47 52.94 50.00	4 4.21 23.53 16.00	2 2.11 11.76 11.76	2 2.11 11.76 5.71	17 17.89
ARTS,HUMANITIES	0 0.00 0.00 0.00	4 4.21 36.36 16.00	1 1.05 9.09 5.88	6 6.32 54.55 17.14	11 11.58
LIFE,HEALTH SCI	3 3.16 18.75 16.67	5 5.26 31.25 20.00	3 3.16 18.75 17.65	5 5.26 31.25 14.29	16 16.84
MATH,PHYS SCI	1 1.05 50.00 5.56	1 1.05 50.00 4.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	2 2.11
PRE-LAW	1 1.05 33.33 5.56	1 1.05 33.33 4.00	1 1.05 33.33 5.88	0 0.00 0.00 0.00	3 3.16
PRE-MEDICINE	1 1.05 100.00 5.56	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 1.05
SOC,BEHAVIOR SCI	0 0.00 0.00 0.00	2 2.11 25.00 8.00	2 2.11 25.00 11.76	4 4.21 50.00 11.43	8 8.42
TEACH:NOT MA,SCI	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1 1.05 100.00 2.86	1 1.05
NOT SURE	0 0.00 0.00 0.00	3 3.16 27.27 12.00	2 2.11 18.18 11.76	6 6.32 54.55 17.14	11 11.58
NOT STATED	0 0.00 0.00 0.00	2 2.11 22.22 8.00	2 2.11 22.22 11.76	5 5.26 55.56 14.29	9 9.47
TOTAL	18 18.95	25 26.32	17 17.89	35 36.84	95 100.00

TABLE 6

MICHIGAN MATHEMATICS EARLY PLACEMENT TEST FOR 1987
HIGH SCHOOL
STUDENT LISTING BY PLACEMENT LEVEL

NAME	SCORE	LEVEL	FIRST CHOICE COLLEGE MAJOR	SECOND CHOICE COLLEGE MAJOR	CURRENT MATH CLASS
	31	2	ENGINEERING	MATH/PHYSICAL SCI	PRE-CALC/ ANALYSIS
	31	2	ENGINEERING	SOCIAL/BEHAVIOR SCI	PRE-CALC/ ANALYSIS
	31	2	ENGINEERING	MATH/PHYSICAL SCI	PRE-CALC/ ANALYSIS
	30	2	ENGINEERING	NOT SURE	PRE-CALC/ ANALYSIS
	30	2	LIFE/HEALTH SCI	NOT SURE	ALGEBRA II
	30	2	ENGINEERING	COMPUTER SCI	PRE-CALC/ ANALYSIS
	29	2	PRE-LAW	ARTS OR HUMANITIES	PRE-CALC/ ANALYSIS
	29	2	ENGINEERING	COMPUTER SCI	ALGEBRA II
	29	2	LIFE/HEALTH SCI	MATH/PHYSICAL SCI	PRE-CALC/ ANALYSIS
	29	2	ENGINEERING	MATH/PHYSICAL SCI	PRE-CALC/ ANALYSIS
	29	2	COMPUTER SCI	ENGINEERING	PRE-CALC/ ANALYSIS
	28	2	ENGINEERING	MATH/PHYSICAL SCI	ALGEBRA II
	28	2	LIFE/HEALTH SCI	SOCIAL/BEHAVIOR SCI	ALGEBRA II
	28	2	ENGINEERING	BUSINESS ADMIN	NOT ENROLLED
	28	2	MATH/PHYSICAL SCI	COMPUTER SCI	ALGEBRA II
	27	2	BUSINESS ADMIN	ENGINEERING	PRE-CALC/ ANALYSIS
	26	2	BUSINESS ADMIN	TEACH: NOT MATH/SCI	ACCELERATED MATH
	26	2	PRE-MEDICINE	COMPUTER SCI	ALGEBRA II
	25	3	LIFE/HEALTH SCI	SOCIAL/BEHAVIOR SCI	PRE-CALC/ ANALYSIS
	25	3	NOT SURE	NOT SURE	ALGEBRA II
	24	3	MATH/PHYSICAL SCI	TEACH: NOT MATH/SCI	ACCELERATED MATH
	24	3	ENGINEERING	NOT SURE	ALGEBRA II
	24	3	NOT STATED	NOT STATED	PRE-CALC/ ANALYSIS
	24	3	ARTS OR HUMANITIES	SOCIAL/BEHAVIOR SCI	NOT ENROLLED
	23	3	ARTS OR HUMANITIES	BUSINESS ADMIN	ACCELERATED MATH
	23	3	ARTS OR HUMANITIES	BUSINESS ADMIN	NOT ENROLLED
	23	3	LIFE/HEALTH SCI	MATH/PHYSICAL SCI	ACCELERATED MATH
	22	3	SOCIAL/BEHAVIOR SCI	PRE-MEDICINE	ALGEBRA II
	22	3	NOT SURE	NOT SURE	ACCELERATED MATH
	22	3	BUSINESS ADMIN	LIFE/HEALTH SCI	ALGEBRA II
	21	3	NOT SURE	NOT SURE	ALGEBRA II
	21	3	ENGINEERING	BUSINESS ADMIN	ALGEBRA II
	20	3	LIFE/HEALTH SCI	MATH/PHYSICAL SCI	ACCELERATED MATH
	20	3	LIFE/HEALTH SCI	NOT STATED	ALGEBRA II
	20	3	NOT STATED	NOT STATED	NOT ENROLLED
	20	3	BUSINESS ADMIN	NOT SURE	ACCELERATED MATH
	19	3	ENGINEERING	COMPUTER SCI	ALGEBRA II
	19	3	ARTS OR HUMANITIES	LIFE/HEALTH SCI	NOT ENROLLED
	19	3	PRE-LAW	SOCIAL/BEHAVIOR SCI	NOT ENROLLED
	19	3	ENGINEERING	ARTS OR HUMANITIES	ALGEBRA II
	19	3	BUSINESS ADMIN	TEACH: NOT MATH/SCI	NOT ENROLLED
	18	3	SOCIAL/BEHAVIOR SCI	SOCIAL/BEHAVIOR SCI	ACCELERATED MATH
	18	3	LIFE/HEALTH SCI	PRE-MEDICINE	PRE-CALC/ ANALYSIS
	17	4	COMPUTER SCI	PRE-LAW	NOT ENROLLED
	16	4	NOT SURE	NOT SURE	REGULAR GEOMETRY
	16	4	NOT SURE	NOT SURE	NOT ENROLLED
	15	4	ENGINEERING	LIFE/HEALTH SCI	NOT ENROLLED
	15	4	LIFE/HEALTH SCI	SOCIAL/BEHAVIOR SCI	NOT ENROLLED
	15	4	BUSINESS ADMIN	COMPUTER SCI	NOT ENROLLED
	15	4	BUSINESS ADMIN	NOT SURE	REGULAR GEOMETRY
	14	4	SOCIAL/BEHAVIOR SCI	NOT STATED	NOT ENROLLED
	14	4	ENGINEERING	ENGINEERING	ACCELERATED MATH
	14	4	NOT STATED	NOT STATED	NOT ENROLLED
	13	4	SOCIAL/BEHAVIOR SCI	ARTS OR HUMANITIES	NOT ENROLLED
	13	4	NOT STATED	NOT STATED	NOT ENROLLED
	13	4	PRE-LAW	SOCIAL/BEHAVIOR SCI	NOT ENROLLED
	13	4	ARTS OR HUMANITIES	NOT SURE	NOT STATED
	12	4	BUSINESS ADMIN	NOT SURE	ALGEBRA I
	12	4	LIFE/HEALTH SCI	ARTS OR HUMANITIES	NOT ENROLLED
	12	4	LIFE/HEALTH SCI	NOT SURE	NOT ENROLLED
	11	5	LIFE/HEALTH SCI	LIFE/HEALTH SCI	NOT ENROLLED
	11	5	ARTS OR HUMANITIES	ARTS OR HUMANITIES	NOT ENROLLED
	11	5	NOT STATED	NOT SURE	NOT ENROLLED
	11	5	ARTS OR HUMANITIES	PRE-MEDICINE	ALGEBRA II
	11	5	NOT STATED	NOT STATED	REGULAR GEOMETRY
	11	5	BUSINESS ADMIN	COMPUTER SCI	NOT ENROLLED
	10	5	NOT STATED	NOT STATED	NOT STATED
	10	5	LIFE/HEALTH SCI	NOT SURE	NOT ENROLLED
	10	5	NOT SURE	NOT SURE	NOT ENROLLED
	10	5	COMPUTER SCI	NOT SURE	REGULAR GEOMETRY
	10	5	ARTS OR HUMANITIES	ARTS OR HUMANITIES	NOT ENROLLED
	09	5	NOT SURE	NOT SURE	NOT ENROLLED
	09	5	TEACH: NOT MATH/SCI	TEACH: NOT MATH/SCI	ALGEBRA I
	09	5	SOCIAL/BEHAVIOR SCI	ARTS OR HUMANITIES	NOT ENROLLED
	08	5	COMPUTER SCI	COMPUTER SCI	REGULAR GEOMETRY
	08	5	BUSINESS ADMIN	ARTS OR HUMANITIES	NOT ENROLLED
	08	5	ENGINEERING	ENGINEERING	NOT ENROLLED
	08	5	ARTS OR HUMANITIES	BUSINESS ADMIN	NOT ENROLLED
	08	5	ARTS OR HUMANITIES	BUSINESS ADMIN	NOT ENROLLED
	08	5	SOCIAL/BEHAVIOR SCI	LIFE/HEALTH SCI	REGULAR GEOMETRY
	07	5	LIFE/HEALTH SCI	SOCIAL/BEHAVIOR SCI	NOT ENROLLED
	07	5	SOCIAL/BEHAVIOR SCI	ARTS OR HUMANITIES	GEN MATH/PRE-ALGEGRA
	07	5	BUSINESS ADMIN	NOT SURE	NOT ENROLLED
	07	5	ENGINEERING	COMPUTER SCI	ALGEBRA II
	07	5	ARTS OR HUMANITIES	NOT SURE	NOT ENROLLED
	06	5	NOT SURE	NOT SURE	ALGEBRA I
	06	5	SOCIAL/BEHAVIOR SCI	NOT SURE	NOT ENROLLED
	06	5	NOT STATED	NOT STATED	NOT ENROLLED
	05	5	LIFE/HEALTH SCI	LIFE/HEALTH SCI	GEN MATH/PRE-ALGEGRA
	05	5	NOT SURE	NOT SURE	NOT ENROLLED
	05	5	NOT SURE	NOT SURE	NOT ENROLLED
	05	5	BUSINESS ADMIN	COMPUTER SCI	GEN MATH/PRE-ALGEGRA
	05	5	NOT SURE	NOT SURE	NOT ENROLLED
	04	5	NOT STATED	NOT STATED	NOT STATED
	04	5	LIFE/HEALTH SCI	LIFE/HEALTH SCI	CONSUMER/CONTEMP MA

NAMES

STUDENT

Other items included in standard school report:

Table 2 - Overall statistics

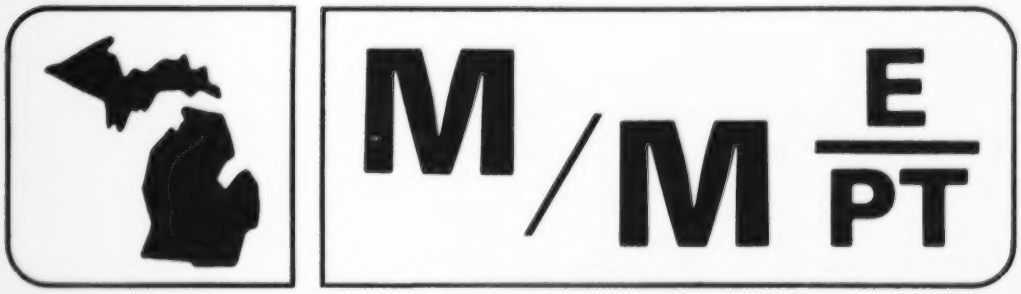
Table 5 - Alphabetic list of student results

Table 7 - List of students feeling poorly or uncertainly prepared

Table 8 - List of students uncertain about or not taking senior math

Table 9 - Placement level breakdown

Item Analysis



The Michigan Mathematics Early Placement Test 1986-87

A Program of
The Presidents Council of
State Colleges and Universities

Administered by
The Seaborg Science and Math Center
Northern Michigan University
Marquette, Michigan

Central Michigan University
Eastern Michigan University
Ferris State College
Grand Valley State College
Lake Superior State College
Michigan State University
Michigan Technological University
Northern Michigan University

Presidents Council

State Colleges and Universities

Oakland University
Saginaw Valley State College
The University of Michigan—Ann Arbor
The University of Michigan—Dearborn
The University of Michigan—Flint
Wayne State University
Western Michigan University

Dear Colleague,

It is a pleasure to announce the initiation of the Michigan Mathematics Early Placement Test (MMEPT). This program reflects the culmination of a two-year effort to design an assessment instrument which will give 11th grade students an appraisal of their mathematical skills in relation to college expectations.

With the active involvement of college and university and secondary mathematics teachers from across the state, over 1,800 students from 18 high schools voluntarily participated in a pilot testing of the MMEPT last year. Based on the results of this project, it was determined that the MMEPT should be made available to students in all school districts.

We were pleased to receive funds in the higher education appropriation bill to enable us to begin the program this year. Although the Presidents Council officially sponsors the MMEPT, Northern Michigan University's Seaborg Center for Science and Mathematics Teaching will have administrative responsibility for the program.

It is our hope that students will take advantage of the opportunity to enroll in additional mathematics courses while they are still in high school. It is also our strong belief that improved preparation in mathematics will significantly reduce the need for students to take remedial or developmental courses in college, which are both time-consuming and expensive. As the demand for strong quantitative skills becomes increasingly important in many fields of study, it is imperative that every student's mathematical competency be developed to the fullest extent possible.

You have our commitment to work cooperatively with you and your students toward the realization of this goal.

Sincerely,

David Adamany, Chair
Presidents Council of State Colleges
and Universities, and
President, Wayne State University

Glenn R. Stevens, Executive Director
Presidents Council of State Colleges
and Universities

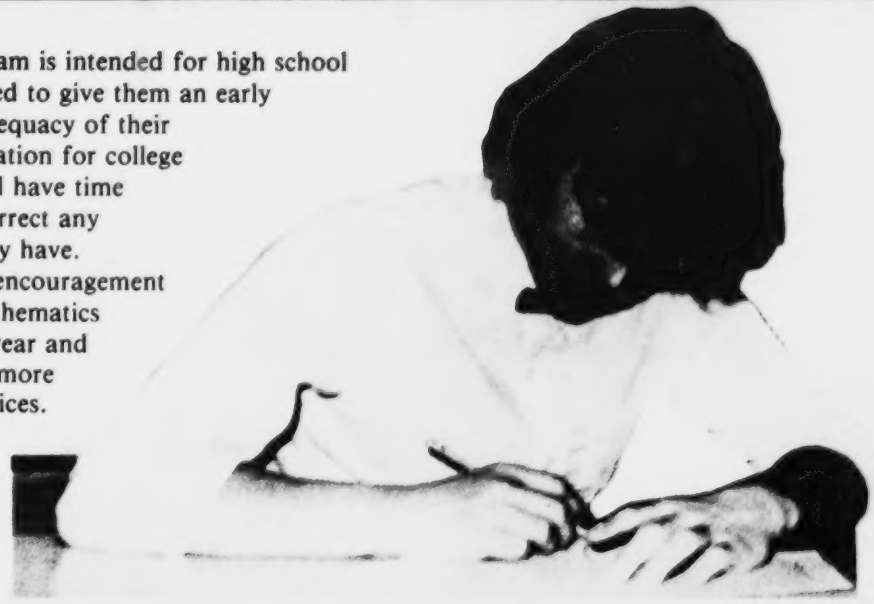
306 Townsend Suite 450 Lansing, Michigan 48933 (517) 482-1563

A PREVIEW OF COLLEGE MATH PLACEMENT . . .

The Michigan Mathematics Early Placement Test (MMEPT) is a 32-question multiple choice test covering those topics in high school mathematics needed by students who plan to attend a college or university. It is very similar to the tests that many colleges and universities give to entering students to place them in the courses that are the right level for them.

. . . FOR COLLEGE-BOUND HIGH SCHOOL JUNIORS

The MMEPT program is intended for high school juniors. It is designed to give them an early indication of the adequacy of their mathematics preparation for college study while they still have time in high school to correct any deficiencies they may have. It will also provide encouragement to keep up with mathematics during their senior year and help students make more informed career choices.



MMEPT GOALS

- Give high school juniors a realistic and individual appraisal of the current state of their mathematics preparation for college level study.
- Provide students with accurate information about the amount and type of mathematics required for their intended college major.
- Encourage students to take additional mathematics courses in their senior year in high school.
- Reduce the number of students in need of costly and time consuming remedial instruction in mathematics upon entering college.
- Provide high school mathematics teachers and counselors with information for use in counseling students regarding their mathematical preparation in relation to career goals.
- Increase minority and female participation in career fields which require high levels of math preparation.
- Promote dialog between high school and college and university faculties concerning curricular issues in mathematics.

MORE THAN A SCORE!

The MMEPT does more than give students another test score. Being like actual college math placement tests, it alerts them to what will be expected of them when they get to college. It sharpens their awareness that what they are doing right now in math class will influence their success in college and their career options.

PERSONAL REPORTS TO STUDENTS

Each student who takes the MMEPT receives a personal report letter, which indicates the student's score and explains its meaning. It also gives some information about the mathematics needed for two college majors in which the student indicates an interest.

April 17, 1986

Dear Jill

This is a report on how you did on the Math Early Placement Test you took a few weeks ago. Your results are as follows:

Test score:	30
Placement level:	2

The maximum test score is 32. The placement levels range from 2 (the highest) to 5 (the lowest). The attached page gives an explanation of the system of levels.

Your placement level of 2 means that if you were entering college right now, you would likely be placed into a course that is just one step below a calculus course. Being at level 2 is a very good place for a high school junior to be. It means that you have stayed with mathematics all along. You will surely want to take your high school's advanced senior mathematics course as well. If you do well in it, you could very well place in level 1 next year when you get to college. This means you will be able to progress without delay into programs which require calculus or other more advanced mathematics.

On your test form, you indicated the following as subjects you may be interested in studying in college:

First choice: Pre-medicine
Second choice: Life or Health Sciences

Students who plan to go to medical school are advised to take a well-rounded undergraduate program and must take courses in chemistry, physics and biology. A good background in college-preparatory mathematics is needed for these. In addition, a year of collegiate-level calculus is often recommended because of the reasoning and problem-solving skills that it develops, and it is required by some medical schools.

If you plan to major in a life or health science area such as medical technology, nursing or agriculture, you can expect to take advanced science classes such as chemistry, biology, physiology and physics where success requires the use of college level algebra. At many colleges and universities, such programs also include at least one course in calculus.

The attached sheet gives further information about the test. Have a good year next year as a high school senior, and make a math course part of that year. It is important for you to remember that a solid foundation in mathematics keeps the doors of opportunity open for you.

Sincerely,

John O. Kiltinen
MMEPT Director

SUMMARY REPORTS TO THE SCHOOLS

Each school which gives the MMEPT to its students will receive a summary report, giving individual results and several group profiles. The table below is a sample of the type of information reported to the school. (Figures given are actual, state-wide results from a pilot study of the MMEPT done in the spring of 1986.)

TABLE 1

Placement Level Breakdown

Level Number	Meaning	Frequency	Percent
2	Ready for pre-calculus	524	29.4
3	Ready for college algebra	675	37.8
4	Need intermediate algebra	311	17.4
5	Need pre-algebra	274	15.4

COSTS

Students who elect to take the MMEPT do so free of charge. Aside from modest mailing costs, there is also no charge to the schools. Funds have been appropriated by the state legislature to each of Michigan's 15 public colleges and universities to support the MMEPT.

WHO SHOULD TAKE THE MMEPT?

Although it is strictly a voluntary testing program, juniors who have college plans are encouraged to take the MMEPT. This is especially the case if they are not taking a mathematics course. Schools may wish to identify their testing group for the MMEPT by targeting those students who have already signed up for the ACT or SAT tests.

WHO GIVES IT? WHEN?

The MMEPT coordinator designated by the school will administer the test. It can be given at the convenience of the school any time after January 15, 1987.

A SUPPORT SYSTEM TOO!

The MMEPT was developed under the guidance of an advisory committee of mathematics instructors from the state supported colleges and universities and selected high schools. These committee members will be available on a regional basis to assist in the interpretation of the test results and to work with high school teachers and administrators on curriculum matters when requested to do so.

The Presidents Council provides further guidance for students planning for college in their booklet, *Designing Your Future, Advice for College-Bound Students.* Copies of this booklet may be obtained from the Presidents Council office at a nominal cost.

HOW TO APPLY

To apply and obtain testing material, simply complete the enclosed application form and mail it to the MMEPT Director at the Seaborg Center at Northern Michigan University. Test booklets and answer cards will be sent to you in advance of your selected testing date. You may expect to receive student and summary reports within two weeks of the return of your materials.

MICHIGAN MATHEMATICS EARLY PLACEMENT TEST

Application Form

Contact Person Name: _____

School Name: _____

School Address: _____

_____

_____

Contact Person's
Job Title: _____

Telephone Number: _____

1. Number of answer cards needed. (The number of students to be tested. Order in multiples of 25.) _____

2. Number of test booklets needed. (If students will not all be tested at the same time, please try to use booklets more than once and keep the order to a minimum. Order in multiples of 25.) _____

3. Proposed testing date. (Allow three weeks for shipping. Date must be after January 15, 1987.) _____

4. Back-up testing date. _____

5. Please describe the means by which you will identify students who will take the test. (E.g., voluntary sign-up for all juniors, all junior English classes, etc.)

_____

_____

Mail this application to: Dr. John O. Kiltinen
MMEPT Director
The Seaborg Center
Northern Michigan University
Marquette, Michigan 49855
Telephone: (906) 227-C'BRG

For office use only. Please do not write below this line.

School Number	Date App. Rec'd	Date Shipped	Date Card Back	Date Bklts. Back	Date Rpts. Sent

7

ABOUT THE SEABORG CENTER

The Glenn T. Seaborg Center for Teaching and Learning Science and Mathematics is Northern Michigan University's new unit for supporting and improving science and mathematics instruction in the schools. Established in August, 1985, it is named in honor of Glenn T. Seaborg, a native of Ishpeming in Michigan's Upper Peninsula. Dr. Seaborg's long career in science, education and public service is highlighted by his receipt of the Nobel Prize in chemistry in 1951.

The Seaborg Center is housed in the Luther S. West Science Building, Northern Michigan University, Marquette, MI 49855. Its telephone number is (906) 227-C'BRG (227-2274).

THE PRESIDENTS COUNCIL

The Presidents Council of State Colleges and Universities is an association of the presidents and chancellors of Michigan's public, four-year institutions. Through the Council and its committee structure, major issues and problems of common concern to Michigan's public higher education community are addressed.

The Presidents Council office is located at 306 Townsend, Suite 450, Lansing, MI 48933. The telephone number is (517) 482-1563.

The Michigan Mathematics Early Placement Test
c/o The Seaborg Center
Northern Michigan University
Marquette, MI 49855

NON-PROFIT
ORGANIZATION
PAID
PERMIT NO. 54
MARQUETTE, MICH.